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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

The Profession of Surgery. By V. ZACHARY COPE, F.R.C.S. 865

Antitumorigenic Action of Testosterone. By Prof. ALEXANDER LIPSCHUTZ, LUIS VARGAS, JUN., and O. RUZ (*illus.*) 867

Pathogenic Staphylococci: their Incidence in the Nose and on the Skin. By E. H. GILLESPIE, M.B., E. A. DEVENISH, F.R.C.S., and S. T. COWAN, M.D. 870

Pancreatic Lithiasis. By W. F. BROOK, F.R.C.S. (*illus.*) 873

Vitamins D_2 and D_3 in Infantile Rickets: A Comparison of their Therapeutic Efficiency. By Prof. NOAH MORRIS, M.R.C.P., and MARY M. STEVENSON, M.D. (*with charts*) 876

Effects of Drugs in Myotonia. By E. GUTTMANN, M.D., and A. B. STOKES, M.R.C.P. (*illus.*) 879

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THE SEARCH FOR TRUTH 887

THE CONTROL OF TETANUS 888

ECONOMICS OF A DECLINING POPULATION 888

ANNOTATIONS

Urea Treatment of Wounds 889

Babies Choose their own Menus 890

Surgery in Ulcerative Colitis 890

Glucose and Insulin in Acute Alcoholism 891

Claude Bernard 891

Light on the Progressive Hyperplasias 892

Narcotic Drug Traffic in the United Kingdom 892

The Fate of Œstrogens in the Body 892

Air-raid Shelters 893

Poliomyelitis Virus in Sewage 893

Hæmaturia with M. & B. 693 893

OBITUARY

George Alexander Sutherland, F.R.C.P. (*with portrait*) 911

Thomas Morrell Thomas, F.R.C.S. 911

Maj.-Gen. W. C. H. Forster, I.M.S. 917

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Medical Diary—Vacancies—Births, Marriages, and Deaths—Appointments. 918

THE NEW ENDOCRINOLOGY

III—The Male Sex Hormone. By Prof. E. C. DODDS, F.R.C.P. (*illus.*) 894

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Medicine and the Law: The Cash Value of Human Life 900

Blood-Groups Explained .. 901

Scotland: The Growth of Surgery 902

United States of America: Soviet Medicine at the World's Fair 902

.... In England—Now... 909

LETTERS TO THE EDITOR

Blood-collection Technique (Drs. C. R. Boland, N. S. Craig, and A. L. Jacobs). 905

Fever Beds in War (Dr. Duncan Forbes) 905

The Hospital Services (Sir E. Graham-Little, M.P., F.R.C.P.) 905

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Medical Libraries in Wartime (Mr. Cyril C. Barnard and others) 908

Position of Medical Students 908

GRAINS AND SCRUPLES

From a Poitrinaire—III... 903

PUBLIC HEALTH

Poliomyelitis in Essex 904

THE LANCET 100 Years Ago 918

PARLIAMENTARY INTELLIGENCE

On the Floor of the House 914

From the Press Gallery: Release of Full-time Members of the E.M.S.—Requisitioning of Hotels in Spas 914

Question Time: Students who Enlisted—Blood-transfusion—Supplementary Rations for Invalids and Others—Consultants in the E.M.S.—Dismissal of Doctors—Salaries for A.R.P. Work—Hutment Hospitals—Payments to Hospitals—Mental Patients—London Children's Hospitals—Outpatients—Midwives—Refugee Nurses 915

MEDICAL NEWS

University of Wales 917

University of Manchester.. 917

University of Sheffield 917

Royal College of Surgeons of England 917

Casualty Evacuation Trains 917

Honours (in India) 918

Royal College of Physicians of Edinburgh 918

Golden Square Throat, Nose and Ear Hospital 918

Food Education Society .. 918

Society for Relief of Widows and Orphans of Medical Men 918

Oxygen and Nitrous Oxide 901

Relief for Polish Refugees. 904

NOTES, COMMENTS AND ABSTRACTS

Sulphanilamide and the Eye 919

The Home Doctor 919

Uphill Journey 919

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CONTENTS

SECTION I
THE HISTORY

CHAP.
1. THE SIX MAJOR SYMPTOMS
2. THE SIX MAJOR SYMPTOMS (*contd.*)
3. MINOR SYMPTOMS
4. THE AUXILIARY HISTORY

SECTION II
PHYSICAL EXAMINATION OF THE CHEST

5. INSPECTION
6. PALPATION
7. PERCUSSION
8. AUSCULTATION

SECTION III
SPECIAL INVESTIGATIONS

9. THE SPUTUM
10. BLOOD EXAMINATIONS—PLEURAL FLUID
11. RADIOLOGY OF THE CHEST
12. SPECIAL DIAGNOSTIC METHODS

SECTION IV
DISEASES OF THE RESPIRATORY TRACT

13. THE NOSE
14. THE MOUTH
15. THE LARYNX
16. THE TRACHEA AND BRONCHI

SECTION IV
(*continued*)

CHAP.
17. ASTHMA
18. BRONCHIECTASIS
19. TUMOURS OF THE BRONCHI
20. CHEST INJURIES — DISORDERS OF THE PULMONARY CIRCULATION
21. EMPHYSEMA
22. COLLAPSE OF THE LUNG
23. PNEUMONIA
24. BRONCHO-PNEUMONIA
25. PNEUMONITIS
26. LUNG ABSCESS
27. PULMONARY TUBERCULOSIS
28. PULMONARY TUBERCULOSIS (*contd.*)
29. TREATMENT OF PULMONARY TUBERCULOSIS
30. NON-TUBERCULOUS CHRONIC LUNG INFECTIONS
31. FIBROSIS OF THE LUNG
32. THE PLEURA
33. "PLEURISY"
34. EMPYEMA
35. TUMOURS OF THE PLEURA
36. THE MEDIASTINUM
37. THE DIAPHRAGM

INDEX

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THE PROFESSION OF SURGERY*

BY VINCENT ZACHARY COPE, M.S. Lond., F.R.C.S.
SURGEON TO ST. MARY'S HOSPITAL, LONDON

THE advance of the surgical craft has been so rapid and its conquests have been so firmly consolidated that it has scarcely been realised that we are face to face with a new profession, new in outlook and achievement, new in its great economic and social importance. The modern profession of surgery bears little or no resemblance to the surgery of sixty years ago. The young surgeon of to-day performs as a routine operations then undreamt of, and from the economic point of view surgery has added health, happiness and working power to the community of a value beyond estimation. In the modern sense surgery was impossible until the meaning of infection was shown and the means of preventing infection of a clean wound were demonstrated.

Lister's first important publication on the use of antiseptics was issued in 1867, while Lawson Tait's empirical but successful aseptic methods began a little later. It took many years for the true meaning of Lister's work to be appreciated, and London surgeons were among the last to accept his teaching. It was at the meeting of the Medical Society of London in October, 1883, that Lister obtained one of his first encouragements in the metropolis, for his paper dealing with the operation for fractured patella was received with acclamation. "Gentlemen," he said, "I thank you must heartily for that cheer; for there was a time when such remarks proceeding from me might have met with a different reception." Yet, during the discussion one well-known surgeon remarked "c'est magnifique, mais ce n'est pas chirurgie."

EVOLUTION OF THE ART

The period between 1867 and 1881, during which the teaching of Lister was rapidly spreading through Germany, America and finally England, may be regarded as the gestation period of modern surgery. Even before 1867 ovarian cysts had, it is true, been successfully removed and colostomies had been performed by several surgeons; and in Germany during this period Billroth was carrying out pylorectomies. But before 1881 no appendix had been removed, no perforated ulcer had been successfully sutured, the functions, let alone the surgery, of the thyroid were unknown, the surgery of the spinal cord and brain—apart from depressed fracture—had not begun, and renal surgery had hardly been touched. It was about 1881 that surgeons first realised the possibilities opened up by the prevention of wound-infection, and the period of 1881–1900—the childhood of modern surgery—saw great advances in all directions. Surgeons explored every type of disease in which they thought relief might be brought my the new surgery. The necessary process of trial and error was not always followed by happy results, but the net gain was so obvious and encouraging that by 1900, when I started my medical studies, the main lines of modern surgery had been laid down, though they were by no means standardised. During the time between 1900 and 1914 the new surgery showed some of the symptoms of adolescence in its instability and in the limited outlook shown by some of the operations suggested and performed. For example, it was a common practice to wash out the peritoneal cavity in cases of peritonitis with a view to mechanically removing the infection; to suture in position various "displaced" viscera which were thought to be causing symptoms; and to treat simple fractures by an insertion of metal plates. Meanwhile there was an increasing standardisation of well-recognised operations, and new fields were being opened up, but certain important sections of surgery were neglected because they were overshadowed by the new advances in abdominal surgery. This was particularly the case in the treatment of wounds and fractures, and in orthopædics generally. It was then, however, that the crude surgical view that established bacterial infection of wounds could be got rid of by antiseptic methods was corrected by the important work of Almroth Wright and others, who, by pointing out how bodily (natural) resistance could be increased, helped to limit the extent of surgical interference in bacterial infections.

During the last war grim necessity forced surgeons to focus their attention on the treatment of wounds, fractures and deformities, and at least one benefit which came from that experience was the rapid development of plastic and orthopædic surgery. The great and unprecedented experience of injuries of the chest during that war also helped to establish the department of thoracic surgery.

Since 1918 surgery has reached maturity. The surgery of the abdomen, thorax and chest, and central nervous system have been brought to a high level, whilst the treatment of fractures, plastic surgery, and wound surgery have been based on scientific principles. No part of the body is now immune from the attack of the surgeon, and no organ or viscus does not at some time or other benefit from his efforts. As with most periods of maturity there are evidences of the development of benevolent conservatism; one might instance the method whereby the wound resulting from the drainage of an acute suppurative focus in bone is allowed to wallow in pus which saturates the plaster casing of the limb, a method salutary but reminiscent of earlier surgery. We see also a tendency towards conservatism in the unwillingness of many surgeons to incise a boil or carbuncle, and in the introduction of an injection treatment for hernia.

The scope of surgery has widened to such an extent that it has become an important factor in maintaining the health of the nation. How important is not generally realised. In 1932 over 150,000 operations were performed in the hospitals of London. This means that at least half a million operations were done that year in the whole country, and we may conclude that one per cent. of the whole population undergoes an operation each year. This high proportion shows how closely the profession of surgery is bound up with the national health.

PATHS TO THE PROFESSION

The corollary necessarily follows that it is in the highest interest of the nation that there should be an adequate supply of thoroughly trained and experienced surgeons. Can it be said that we have such a supply? No doubt hospital surgeons are worked harder than they were, if we take the number of operations performed as a criterion. If we take my own hospital—St. Mary's—as an example we find that sixty years

* Presidential address delivered before the Medical Society of London on Oct. 9.

ago there were ten operating surgeons, while today there are fifteen. But during these sixty years the number of operations has multiplied more than tenfold.

Operations at St. Mary's Hospital

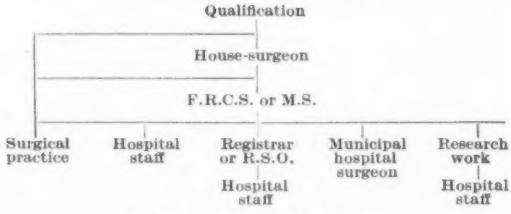
1877	154	1890	880
1878	212	1899	944
1879	290	1906	1637
1880	405	1907	1798
1881	435	1938	3500
1882	613		

These figures show the increase of work which must have fallen to the individual surgeon but do not prove a dearth of surgeons. Those who dwell in large cities may be tempted to think that the profession of surgery is overcrowded, and judging by the number of well-qualified surgeons who apply for honorary appointments at the larger voluntary hospitals there is some ground for this opinion. One must remember, however, that most of the talented and ambitious men naturally gravitate to the large cities.

One can perhaps form a better opinion by considering the number of surgeons who obtain the higher surgical qualifications. In England and Wales the F.R.C.S. is the best recognised qualification. At the beginning of the modern surgical era, in 1880, there were 1215 holders of this coveted diploma; in 1938 there were 2480. Thus in sixty years operations have increased tenfold but the number of surgeons who possess the F.R.C.S. has merely doubled. Admittedly there are other high surgical qualifications, but there is no reason to suppose that their rolls have increased disproportionately to the English Royal College. We must conclude either that the nation was over-supplied with surgeons in 1880, or that it is under-supplied now. That the latter is the more likely is supported by the fact that many surgeons in urban districts are attached to two, three or even four hospitals of considerable size, while in more remote parts the surgical needs of the district have sometimes to be met by men who have not undergone the training which modern views would consider essential.

Though major surgery requires a high degree of special knowledge there is, in this country, no legal compulsion for the surgeon to have any postgraduate training or to obtain any additional diploma before he starts to practise surgery. The only guarantees that intervene between the incompetent surgeon and the public are the judgment of election committees of hospitals and of his medical colleagues in practice, and the surgeon's own sense of responsibility. It is a testimony to the good sense of the profession that these guarantees so seldom fail. Failures might be almost entirely avoided if everyone who wished to practise major surgery had to undergo a sufficiently long postgraduate training under supervision and pass a special examination. In actual practice this is what, in the majority of cases, does happen, but there is no legitimate reason why there should be any exceptions. Consider the routes followed by those who wish to become surgeons.

The usual procedure is to work for a staff appointment at a voluntary hospital. The aspirant after qualification fills a post of house-surgeon and perhaps some other resident post. He then takes the F.R.C.S. or an equivalent surgical qualification, becomes a surgical registrar or resident surgical officer and after that gains a staff appointment. This training ensures good experience under supervision, and, since the election of the staff is usually under the control of the men who have supervised the candidate's work, the staff is likely to be recruited well. Occasionally a man may gain a staff appointment without serving as registrar but after doing some special piece of research work. Some men after taking their fellow-



Alternative routes of the surgeon

ship enter municipal service where they get excellent experience with a varying amount of supervision and may remain as specialist surgeons or act as consultants; many leave the service after a few years and get on the staffs of hospitals, though not commonly the larger voluntary hospitals.

Nearly all these different routes ensure experience under the supervision of senior men. But the need for surgeons is so great, and the opportunities for gaining experience under supervision so limited, that many men get on the staffs of smaller hospitals with much less training. They may hold one or more house-appointments, and then without gaining a higher surgical degree, may join a practice which enables them to get on a hospital staff and perform major surgery with what most would regard as inadequate training. The gaining of technical skill by these men must be a more trying and difficult process, both to themselves and their patients, than if they were first equipped with supervised postgraduate experience. This statement applies with still greater force to those, fortunately rare, instances where men who have not even filled a house-appointment go straight into practice and attempt major surgery. The surgeon cannot be standardised any more than the general practitioner, but it should be possible to ensure a greater minimum of preliminary knowledge and experience for anyone who wishes to become a surgeon.

THE NEED FOR REFORM

The present rather unsatisfactory state of affairs could hardly have been avoided. Fifty years ago no-one dreamt that surgery would become the great and indispensable need that it is today, and one cannot be surprised that the organisation of the profession failed to keep pace with its increase in importance. The same excuse will not be allowed for surgeons of the future now that the social importance of the surgeon and his need for special postgraduate training are clearly realised.

A similar deficiency in the training of surgeons in the United States has recently led the American College of Surgeons to initiate a scheme whereby every candidate for a fellowship must undergo a strict and extended apprenticeship. The applicant must have completed three years' service in one or more acceptable hospitals, of which two years shall have been spent in training in surgery, and must in addition submit detailed case-records of 50 major operations performed by himself. The general character of the candidate also has to bear a close scrutiny by a committee. It is claimed for these new regulations that "an applicant who can meet all the stipulated requirements is fitted to do actual surgery, whereas the ordinary written and quiz examinations, which

are accepted as evidence of eligibility for fellowship in the European colleges of surgeons would prove only his theoretical knowledge of the subject." This criticism is not entirely just, for in most of the higher surgical examinations in Great Britain the candidates must have filled at least one surgical appointment in an approved hospital; nevertheless, it is probably true that none of the higher British surgical qualifications sufficiently insists upon supervised practical experience as an essential preliminary. Some of the higher surgical degrees indeed seem more in the nature of competitive examinations than tests of the candidate's skill and experience.

SOME SPECIAL PROBLEMS

The general level of surgery in this country, however, is high, and the position of the surgeon in the community probably higher than it has ever been. The surgeon has gained the confidence of his fellow citizens to such an extent that he is often expected to do the impossible. The public seem to think that if only the surgeon will do something then good is almost sure to result. Some of the most difficult moments of the conscientious surgeon are those when he must advise against operation in cases where the anxious relatives are clamouring for something to be done.

The life of a surgeon is of absorbing interest. Whether considered from the humanitarian standpoint of serving his fellow creatures or from the scientific aspect of opportunities for research, or even from that less praiseworthy but common desire which mortals have of obtaining benevolent power to control the destinies of others, the life of a surgeon can give great satisfaction. To no man is the destiny of human life so often delivered, to no man's single responsibility does the decision so often rest for action which may make or mar a human life. He has not only to give judgment but must himself carry out the sentence. His power of speedy diagnosis and decisive action in a crisis is of the greatest value, and its exercise brings a sense of self-reliance which has to be curbed lest it develop into intolerance. As the clever physician-dramatist has written (probably with his tongue in his cheek):

> "He is surrounded by respectful and even adoring acolytes, and he holds the power of life and death over helpless persons. . . . If he is to avoid madness he must stand aside from the business from time to time and deride himself and his colleagues."

One might be satisfied if each surgeon were content to limit his criticism and derision to his own failings. As a fact there is much less intolerance now than in former times. Most surgeons are moderate in the advocacy of their own methods and eager to gather information and new technical methods from their colleagues. The various surgical clubs and associations are sufficient evidence of this. Yet in some respects the surgeon of today is more isolated than his forerunner of fifty years ago. At the beginning of the modern era it was customary to have regular consultations between all the members of the staff at the large hospitals, and each senior surgeon was actually assisted by his junior at operations. The increase in the amount of work falling to the lot of junior surgeons has caused this practice to fall into disuse. Each member of the staff works on his own and may seldom see his colleagues operate. However, there are welcome signs that a different kind of coöperation will soon be general. The advantage of the group-system of examination is too great to be neglected; in future we think the physician will be more regularly called in to give his opinion as to the risks of operation and the advisability of performing it; the pathologist will be asked not only to pass an opinion on a section cut from a piece of tissue sent to him without sufficient details as to the clinical features of the case, but will come and consult with the surgeon at the bedside; the radiologist will in like manner take an active part in clinical diagnosis. By these means the diagnosis made by the surgeon will be discussed, challenged or confirmed and all to the benefit of the patient.

REWARDS

The competent surgeon is assured of an honoured place in the community. He does not seek and seldom gains much public recognition, but with him the gaining of the high regard of his fellow-surgeons counts for more than social distinction. If opportunity offers he may have the extra happiness which comes from pursuing some useful work of research. In material rewards there is great variation. We have travelled far from the time of Ambroise Paré who wrote of one of his distinguished patients: "He was cured by the grace of God and he made me a handsome present, of such sort that I was well contented with him and he with me, as he has shown ever since."

The young surgeon who follows the orthodox path of preparation for the staff of a voluntary hospital often has many lean years before him. Though well qualified and spending nearly all his time for the benefit of the community he may receive a bare subsistence. Even when elected to the staff of a hospital he may find it hard to make ends meet. This unsatisfactory state of affairs is likely to find its own remedy. The average surgeon ought to and usually will receive adequate pecuniary reward, though, owing to the decentralisation of surgery, it is unlikely, and perhaps undesirable, that the rewards will ever be as great as they were in the opening days of the new era; for the man who enters the surgical profession chiefly to make a fortune has already made a mistake in that he falls short of the ideal which ought to inspire him. The best reward of the surgeon must always be the satisfaction of knowing that interesting, useful and skilful work has been faithfully performed.

ANTITUMORIGENIC ACTION OF TESTOSTERONE

BY PROF. ALEXANDER LIPSCHÜTZ,
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IT has been shown that the development of the uterine and extra-uterine fibroids produced experimentally by a prolonged course of injections of the monobenzoate ester of œstradiol can be partly inhibited by the simultaneous injection of progesterone (Lipschütz, Murillo, and Vargas 1939). We now describe the control of experimentally produced fibroids by injection of testosterone propionate. Our experiments are still in progress; but, since the experimental production and inhibition of fibroids (Lipschütz and Vargas 1939; see also the pioneer work of Nelson, and of Moricard and Cauchoix, Lipschütz and Iglesias) bear directly on the possibility of finding a suitable hormone therapy for uterine fibroids in women (*Lancet* 1939, Todd 1939), we

Expt.	Animals	Duration of expt. (days)	Treatment		Proportion of œstradiol to testosterone[3]	Fibroids and macroscop. fibrosis: total mark	Animals with some tumoral or fibrous reaction	Animals with individual tumours of mark not less than 1
			Œstradiol weekly (mg.)	Testosterone weekly (mg.)				
I	10	103	0	1·25	0·1	0	None	None
II	38	47–84	0·24	0	1·0	more than 5	All	34 out of 38
III	8	84–120	0·12	0	1·0	2	All	4 out of 8
IV	2	104	0·24	1·25	1·5	more than 4	All	All
V	4	105–111[1]	0·12	1·25	1·10	5·5	All	All — out of 8
VI	2	104	0·24	1·25[2]–5·0	1·12·6	6·5	All	1
VII	3	108–122	0·12	1·25[2]–5·0	1·22	0·7	2	None
VIII	2	137–158[1]	0·12	6·25	1·52	0·5	1 — out of 7	None — out of 7
IX	2	122–137	0·12	10·0	1·88	0·5	1	None

1. One animal with œstradiol only during the first three weeks and then with both hormones.
2. For the first 53 days, then increased.
3. For simplification the total quantities of the hormones are compared.

communicate our results, though still indefinite because of the rather small number of experiments.

It is known since the work of Zuckerman and Parkes (1936) and of De Jongh et al. (1938) that male hormones may counteract the stimulating effect of the follicular hormone on the epithelial and fibrous parts of the prostate. This led us to try testosterone propionate as an antidote against experimentally produced fibroids. Further, the male hormone has already been used in the clinical treatment not only of uterine epithelial proliferation but also of fibroids (Loeser 1938).

EXPERIMENTS AND RESULTS

To 15 castrated female guineapigs, weighing 360–750 g., three subcutaneous injections of 40 μg. and in some cases 80 μg. of œstradiol monobenzoate were given weekly. Simultaneously various quantities of testosterone propionate* were injected thrice weekly. The results are given in the accompanying table. The number of animals escaping some macroscopically visible fibrous reaction or development of individual tumours (of mark not less than 1) is nil or insignificant when 80 μg. of œstradiol monobenzoate is injected thrice weekly for seven to twelve weeks (experiment II). The number of animals without individual tumours increases when only 40 μg. is given per injection (expt. III); but tumorigenesis is still considerable with this quantity of œstradiol. No change is induced when 5–13 parts of testosterone is injected simultaneously with 1 part of œstradiol (expts. IV–VI); but the whole situation seems to change when the proportion of testosterone is raised to more than 22 parts (expts. VII–IX). Out of seven animals (expts. VII–IX) there were three without any visible fibrous or tumoral reaction, and not a single animal developed tumours of mark not less than 1. There was only fibrosis or a tumoral seed characteristic of a weak tumoral reaction (Vargas and Lipschütz 1939). The difference between the eight animals receiving 1 part of œstradiol to 5, 10, and 13 parts of testosterone (expts. IV–VI) as compared with the seven animals receiving 22–88 parts of testosterone (expts. VII–IX) is striking.

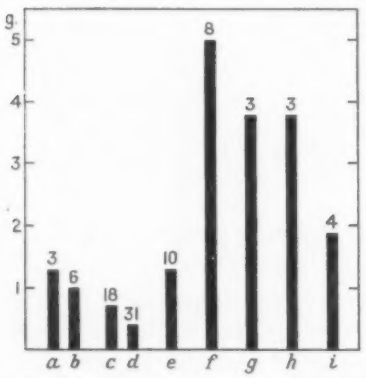

FIG. 1—Diagram showing stimulating and inhibiting action of testosterone on the weight of the guineapig's uterus: (*a*) normal adult females treated for five months with olive oil 0·4 c.cm. injected subcutaneously thrice weekly; (*b*) virginal females more than a year old; (*c*) castrated females treated with injections of olive oil; (*d*) castrated females not treated with olive oil; (*e*)–(*i*) castrated females treated with: (*e*) testosterone propionate (expt. II in table); (*f*) œstradiol monobenzoate (expt. III); (*g*)–(*i*) testosterone and œstradiol simultaneously (expts. V, VII, VIII, and IX) in the following proportions of œstradiol to testosterone: (*g*) 1 to 10; (*h*) 1 to 22; and (*i*) 1 to 52–88. The numerals at the tops of the columns indicate the number of guineapigs in each group.

* Supplied by the courtesy of Dr. Carl Miescher, of Messrs. Ciba, Basle.

DISCUSSION

There is, however, a weak point in our experiments. In order to avoid using large quantities of testosterone we used 40 μg. of œstradiol per injection instead of 80 μg. This has the disadvantage that some animals receiving 40 μg. per injection will not develop any individual tumours of appreciable size (expt. III). Thus the objection can be raised that the lack of tumours of appreciable size (of mark not less than 1) in all the animals in expts. VII–IX was not due to the inhibiting action of testosterone but rather to an experimental hazard. It is for this reason that we hesitated to report these results of our experiments with testosterone. Dr. J. Luco is now carrying out in this department an experimental investigation on a greater number of animals; so in about three months we hope to have more convincing results.

On the other hand, certain observations of ours speak in a striking manner in favour of an inhibiting action of testosterone against the stimulating action of œstradiol on smooth muscle-fibres and on the uterine mucosa. The stimulating influence of testosterone on the uterus is well known, thanks to the extensive work of Korenchevsky, Dennison, and Hall (Korenchevsky 1939), Courrier and Gros (1938), and others (Varangot 1939). In our experiments we succeeded in maintaining with testosterone propionate the uterine weight of castrated animals on the level of a normal adult virginal female. When œstradiol monobenzoate is given in sufficient quantities, the uterine weight increases enormously. When both

hormones are given simultaneously, a considerable decrease is obtained as compared with the benzoic ester of œstradiol alone (Ruz 1939) (see fig. 1). The increase of uterine weight caused by œstradiol is due partly to the growth of the myometrium and partly to epithelial growth, which, as is well known, can become enormous under similar experimental conditions. This atypical tumoral growth of the endometrium due to œstradiol is also inhibited when sufficient quantities of testosterone are given (figs. 2 and 3).

Since testosterone has already been used in the treatment of epithelial uterine growth (Loeser 1938, Foss 1938) and of uterine fibromyoma, apparently with a satisfactory result (Loeser 1938, Turppault 1938), it may be useful to emphasise that, so far as the inhibiting action of testosterone is concerned, the conditions in the woman are probably more complicated than in our experiments with exogenous œstradiol. In the woman the source of the tumorigenic œstradiol is the ovary; testosterone, given to a patient with epithelial or fibrous growth, will probably act not only on the tumour (as in our experiments) but also on the gonadotrophic complex of the anterior lobe of the pituitary and thus also on the ovary, interfering with the production of œstradiol. Indeed it cannot be excluded that, even in our experiments, the inhibiting action of testosterone is partly brought about through the anterior lobe, which seems to play a part in the tumoral reaction of our experimental animals. It is probably by a sex-specific difference in the endocrine function of the anterior lobe that the striking sexual specificity in their fibrous tumoral reaction may be explained which male and female guineapigs, even when castrated, show when injected with follicular hormone (Koref, Lipschütz, and Vargas 1939, Jedlicky, Lipschütz, and Vargas 1939, Chaume).

SUMMARY

When the monobenzoate ester of œstradiol was given to castrated guineapigs simultaneously with testosterone propionate up to the proportion of 1:13 uterine and extrauterine fibroids developed in the usual manner as with similar quantities of the ester of œstradiol alone.

When the proportion of œstradiol to testosterone was raised to 1:22 or more, no fibroids of appreciable size developed, only some fibrous reaction or tumoral seed being produced, which seems to be characteristic of a diminished tumoral sensibility.

The objection can be raised that the individual variations, so far as the tumoral reaction is concerned, are so great that the apparent inhibiting action of testosterone may be due to an experimental hazard; but the inhibiting action of testosterone against the stimulating action of œstradiol is revealed also by the following experimental findings: (1) though the uterine weight is maintained by testosterone alone in a castrated animal on a normal level, the male hormone will suppress the increase of the uterine weight due to œstradiol, especially when the hormones are given in a proportion of more than 1:22; and (2) the atypical growth of the endometrium and its glands due to œstradiol is partly inhibited by testosterone.

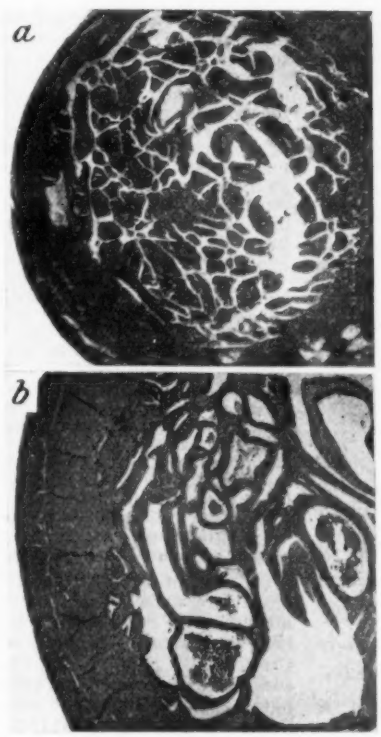

FIG. 2—Sections of uteri of two castrated female guineapigs treated with œstradiol monobenzoate 40 μg. injected subcutaneously thrice weekly for 122 and 102 days (expt. III), showing (*a*) polypous development of uterine mucosa and (*b*) cystic development of uterine glands. (× 12.)

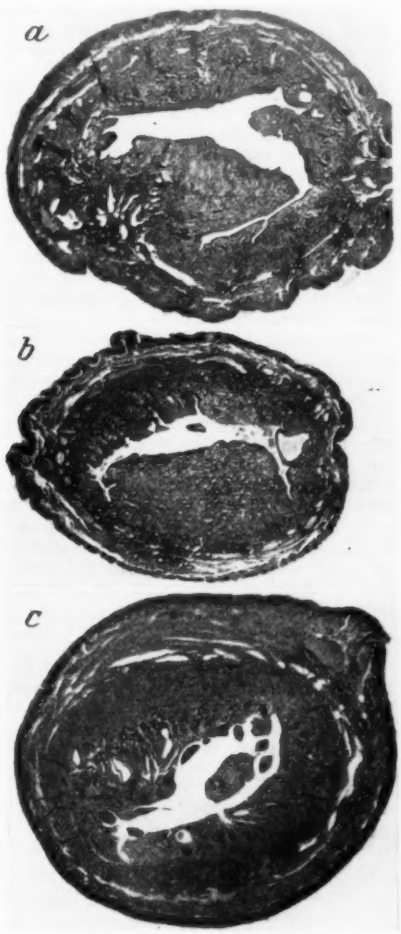

FIG. 3—Sections of uteri of three castrated female guineapigs treated simultaneously with three subcutaneous injections of œstradiol monobenzoate 40 μg. and one injection of (*a*) 6·3 mg. and (*b* and *c*) 10 mg. of testosterone propionate weekly for 158, 122, and 137 days respectively. Uteri weigh 2, 1·8, and 1·7 g. respectively. Note inhibition by testosterone of stimulant action of œstradiol on the uterine mucosa. (× 12.)

References at foot of next page

PATHOGENIC STAPHYLOCOCCI

THEIR INCIDENCE IN THE NOSE AND ON THE SKIN

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During an investigation of an outbreak of septic infections in operation wounds Devenish and Miles (1939) found that three of four surgeons tested were nasal carriers of *Staphylococcus aureus*. One of these three was a persistent skin carrier of a strain of *Staph. aureus* identical with the nasal strain. The *Staph. aureus* carrier state in the nose is relatively common. It is obviously of surgical importance to know the incidence of the *Staph. aureus* carrier state in the skin, and its connexion with infestation of the nose. Hart (1937) found that the nasal-carrier state in an operating-theatre staff was intermittent. Hallman (1937) and McFarlan (1938) determined the nasal-carrier-rate of potential pathogenic staphylococci in students and in hospital patients. McFarlan found no direct relationship between staphylococcal nasal carriage and staphylococcal infections.

There appears to be no record of any survey of the incidence of staphylococci both in the nose and on the skin in which the cocci were identified as potentially pathogenic. We have determined the nasal- and skin-carrier-rates in medical students and compared them with the incidence of nasal and skin infections, and we have attempted to show the relation between infestation of the nose and of the skin. Two surveys were made. In the first, 159 students were swabbed; in the second, 40 students selected from the first group were swabbed again, and stringent tests were made for the skin-carrier state under conditions comparable with those in an operation theatre.

First Survey

During the eight weeks from Oct. 19 to Dec. 16, 1938, nasal and skin swabs were taken from 159 healthy medical students and recently qualified assistants, whose ages ranged from 19 to 30. Swabs were taken from 66 per cent. of the students of University College Hospital; the volunteers were representative of the total student population, though first-year students predominated slightly. During the survey there was no noticeable outbreak of colds or influenza in the students or in the general population. The past history with regard to acute and chronic infections of the skin, nasal cavities, and nasal sinuses was obtained from each volunteer.

Both nostrils were sampled with one cotton-wool swab. For the skin sampling an area about 2 in. in diameter on the back of each wrist was rubbed about twenty times with a swab moistened in broth, a separate swab being used for each wrist. Swabs were cultured on Fildes's peptic-digest-blood-agar plates, incubated at 37° C. for twenty-four hours and then in moderate daylight at room temperature for forty-eight hours to facilitate production of pigment.

Likely colonies of golden staphylococci and, in their absence, white staphylococci were examined as regards their morphology, fermentation of mannitol, and production of pigment, coagulase, and α-hæmolysin. The production of pigment by all the cocci isolated was determined by a simultaneous seeding on to segments of blood-agar plates, which were incubated for twenty-four hours at 37° C. and examined after standing three and seven days in moderate daylight at 18° C.

The methods for testing the production of α-hæmolysin and coagulase closely resembled those used by McFarlan (1938). Subcultures in 0·5 c.cm. nutrient broth (in 3 by $\frac{5}{16}$ in. tubes) were incubated at 37° C. for forty-eight hours in air containing 30 per cent. of carbon dioxide. The cultures were centrifuged, and 0·1 c.cm. of the supernatant fluid was tested for α-hæmolysin against a 2 per cent. suspension of rabbit red corpuscles. A control tube containing one unit of staphylococcal α-antitoxin was set up for each strain. Readings were made after an hour at 37° C. and eighteen hours on the bench. To the remaining 0·3 c.cm. of culture an equal quantity of a 50 per cent. solution of citrated human plasma in saline was added. The test was read after three hours at 37° C. and after eighteen hours at 18° C.

Since differences in the specimens of plasma may cause variations in the coagulase test (McFarlan 1938), plasma from two persons only was used exclusively throughout the investigation. While testing strains isolated in the second survey, it was found that either incubation in air containing 30 per cent. of carbon dioxide or growth in the 3 by $\frac{5}{16}$ in. tubes in air inhibited the production of coagulase. Tests of media and plasma did not reveal any reason for the sudden appearance of this inhibition by carbon dioxide. A similar observation has recently been made by Di-Rocco and Fulton (1939). For coagulase tests in the second survey a large loopful of a 24-hour blood-agar plate culture was added to 0·2 c.cm. of plasma, shaken well, and the result read after incubation as above.

Strains of staphylococci with the following characters were labelled "potentially pathogenic": monomorphic gram-positive cocci producing α-hæmolysin and human-plasma coagulase. According to Cruickshank (1937) and Chapman et al. (1938) coagulase is the simplest reliable test for potential pathogenicity. Since pigmentation is by itself of limited value, Bigger (1937) and Cowan (1938) suggested the name of "*Staph. pyogenes*" for all potentially pathogenic staphylococci. The name has been adopted in this paper.

All typing was performed by one of us (S. T. C.) with the slide-agglutination method (Cowan 1939), dividing the strains into the three main types I, II, and III, and into six additional subtypes according to the reactions of the strains with absorbed sera. All strains of *Staph. pyogenes* isolated from any one individual at one or both surveys were typed and compared at the same time.

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TABLE I—BIOLOGICAL PROPERTIES OF STAPHYLOCOCCI ISOLATED FROM 159 STUDENTS

Strain	No.	α-Hæmolysin		Coagulase		Mannitol		*Staph. pyogenes*
		+	−	+	−	+	−	
Golden colony ..	130	112	18	112	18	114	16	112
White „ ..	102	0	102	0	102	60	42	0
Yellow „ ..	78	0	78	0	78	51	27	0
α-Hæmolysin-positive ..	112	..	..	112	0	110	2	112
α-Hæmolysin-negative ..	198	..	..	0	198	115	83	0
Coagulase-positive ..	112	..	..	..	..	110	2	112
Coagulase-negative ..	198	..	..	..	..	115	83	0

RESULTS

Properties of staphylococci isolated.—Of over 400 strains of gram-positive cocci isolated and tested 310 were staphylococci; their biological properties are shown in table I. The 112 strains identified as potentially pathogenic staphylococci (*Staph. pyogenes*) all produced a gold pigment. Many strains provisionally labelled "golden" on first isolation were readily assigned to the "yellow" class when compared with other strains in the simultaneous re-test of production of pigment. Of the 112 strains only 2 did not ferment mannitol; and only 4 of the 18 non-pathogenic *aureus* strains fermented mannitol.

TABLE II—INCIDENCE OF *Staph. pyogenes*-CARRIER STATES

Group	Site	No.	Percentage of total ± S.E.
A	Nose only	49	30·8 ± 3·6
B	Nose and skin	20	12·6 ± 2·6
C	Skin only	11	6·9 ± 2·0
D	Negative	79	49·7 ± 4·0

There was a complete correlation between the production of α-hæmolysin and that of coagulase. Of the 18 "non-pathogenic" golden strains only 1 came from a nasal cavity.

Carrier incidence of Staph. pyogenes.—Of the 159 nasal swabs 69 were positive, a nasal-carrier-rate of 43·4 per cent. There were 31 (19·5 per cent.) skin carriers (right or left wrists, or both). The total population may be conveniently divided into four groups as in table II. Group A are nasal carriers, B double carriers, C skin carriers, and D non-carriers. It will be seen that 50 per cent. are carriers of *Staph. pyogenes*: 30 per cent. in the nose only, 13 per cent. in the nose and on the skin—i.e., double carriers—and only 7 per cent. on the skin alone.

Nasal and skin carriage.—Table III shows that the skin-carrier-rate is associated with the nasal-carrier-rate. The percentages of skin carriers in nasal carriers and in nasal non-carriers differs by 16·8 ± 6·4 per cent. The number of colonies of *Staph. pyogenes* developing from the swabs of the 69 nasal carriers was large (more than fifty) in all except 10 instances. In these 10 the number of colonies was less than six. If we transfer these 10 to the nasal-non-carrier group on the grounds that a feebly positive culture indicates no more than a transient nasal infestation with *Staph. pyogenes*, the association of the skin-carrier state with heavily infected noses is striking; the skin-carrier-rate in the nose-positive group is in this case 22·9 ± 6·5 per cent. greater than that in the nose-negative group, and in the X^2 test P falls to 0·0016. But even without this refinement of the data the association between nasal- and skin-carrier states is strong. It is further strengthened by the results of typing the strains from the 20 double carriers in group B: 18 were carrying the same serological type in the nose and on the skin. Moreover, in the second survey, 7 more double carriers were found. In only 4 of the 27 examined was the nasal strain serologically different from the skin strain. One colony only from each site was tested serologically. In one case a single colony proved to be a mixture of two types; it is possible that, had more colonies been tested, infestation with more than one type might have been detected with greater frequency, and the correspondence of types in the 27 double carriers might have been more complete.

TABLE III—ASSOCIATION OF NASAL- AND SKIN-CARRIER STATES

Nasal carriers	No.	Skin carriers		
		+	−	Positive (per cent.)
+	69	20	49	29·0
−	90	11	79	12·2
Total ..	159	31	128	19·5

$n = 1$. $\chi^2 = 5·97$. P = 0·016 (see Hill 1937)

The carrier state and length of sojourn in hospital.—The data, not tabulated here, showed that there was no relation between the carrier-rates and the length of the students' sojourn in hospital. Each half-yearly group contained about the same proportion of carriers. Nor was there any association with the age or sex of the student.

The nasal-carrier state and history of chronic nasal disease.—Of the population sampled 39 gave a history of chronic nasal disease in the form of discharge, chronic catarrh, or sinusitis; 25 of these were nasal carriers of *Staph. pyogenes* (table IV). The per-

TABLE IV—ASSOCIATION OF NASAL-CARRIER STATE WITH HISTORY OF CHRONIC NASAL DISEASE

Nasal carriage	No.	Chronic nasal disease		
		+	−	Positive (per cent.)
+	69	25	44	36·2
−	90	14	76	15·5
Total ..	159	39	120	24·5

$n = 1$. $\chi^2 = 7·93$. P = 0·005

centage difference between the incidence of nasal disease in nasal carriers and in the remainder of the students is 20·7 ± 6·9, suggesting that there is an association between the two conditions. It must be emphasised that the association is between the nasal-carrier state and a history of nasal disease; no rhinological examinations were made. Analysis of the data revealed no association between nasal carriage and chronic or repeated "colds."

Nasal- and skin-carrier states and skin infections.—Several volunteers had a history of superficial skin infections, such as boils or pustules. Table V shows their distribution among the various carrier groups.

The positive carriers show a slightly higher percentage of skin infections, but the difference is not statistically significant. If the skin infections, boils and pustules, are considered separately, again there is no statistical evidence of association.

TABLE V—ASSOCIATION OF NOSE- AND SKIN-CARRIER STATES WITH HISTORY OF SKIN INFECTIONS

Group	Site of carriage	No.	History of skin infections			Percentage difference ± S.E. difference
			+	−	Positive (per cent.)	
A	Nose only	49	21	28	42·8 ± 7·9	7·2 ±13·2
B	Nose + skin	20	10	10	50·0 ±11·2	
C	Skin only	11	6	5	54·5 ±15·0	17·8 ±15·7
D	Negative	79	29	50	36·7 ± 5·4	
A + B	Total nose	69	31	38	45·0 ± 5·2	6·1 ± 7·9
C + D	Total non-nose	90	35	55	38·9 ± 5·1	
B + C	Total skin	31	16	15	51·6 ± 9·0	12·6 ± 9·7
A + D	Total non-skin	128	50	78	39·0 ± 4·3	
—	Total ..	159	66	93	41·5 ± 3·9	—

Second Survey

The second survey, made in the latter half of February, 1939, was designed to test the constancy of the nasal- and skin-carrier states and their association and to compare the incidence of *Staph. pyogenes* on the skin, determined by superficial swabbing, with that in the deeper parts of the skin. Ten students were selected at random from each of the four groups A, B, C, D (table II) and were swabbed as before. They also washed up for eight minutes as for an operation, applying hot water and soap and a brush for the nails, rinsed the hands in a 70 per cent. solution of spirit, and powdered the hands, when dry, with a minimum of sterile French chalk. After putting on dry sterile rubber gloves each student was exposed to a humid atmosphere at 80° F. Sweating was induced by the immersion of the gloved hands in a hot-water bath at a temperature of 40°–43° C. As soon as the student showed perspiration on the forehead and inside the cuffs of the gloves (usually after five to thirty-five minutes), 0·5 c.cm. of broth was pipetted into each glove and well massaged into the hands. The gloves were then peeled off and their inside surfaces pressed on to Fildes's agar plates, which were incubated and examined for *Staph. pyogenes*.

TABLE VI—COMPARISON OF CARRIER STATES IN 40 STUDENTS

First survey		No.	Second survey			
Group	Site		Nose +, skin +	Nose +	Skin +	Both negative
A	Nose +	10	4 (1 glove +)	5	0	1
B	Nose +, skin +	10	6 (2 gloves +)	2	0	2
C	Skin +	10	1 (0 gloves +)	2	2	5
D	Both negative	10	2 (2 gloves +)	1	0	7
—	Total ..	40	13 (5 gloves +)	10	2	15

RESULTS

Constancy of the staphylococcal-carrier state.—Table VI shows how the 40 students fell into the different groups at the second swabbing: 5, 6, 2, and 7 students respectively remained in their original groups A, B, C, and D; and 2 originally in the negative group D had become double carriers and 1 a nasal carrier; of the skin carriers (group C) 2 became nasal carriers and 1 a double carrier; only 2 remained in group C. Table VII indicates the relative constancy of nasal carriage on repeated swabbing: of 20 nasal carriers 17 remained nasal carriers, and in 14 of these the infesting staphylococcus was of the same serological type at both surveys. As before, it is possible that the three discrepant strains in each pair were only partly representative of the nasal staphylococci, for only one colony of *Staph. pyogenes* was examined serologically in each case. The high proportion of students that remained carriers of the same strain suggests that nasal carriage is relatively constant and chronic.

Relation of glove infection to the staphylococcal-carrier state.—The glove test distinguishes those who carry *Staph. pyogenes* superficially enough for its complete removal by surgical scrubbing-up from those in whose skin the infestation is deep. There were 15 superficial skin carriers among the 40 students tested, but of these only 5 were deep carriers by the glove test. There were no deep carriers in the group negative by the superficial skin test (table VI). Moreover, all 5 deep carriers were in the double-carrier group, as determined by the ordinary swabbing test. Deep skin infestation appears to depend on the double-carrier state, and the dependence is strengthened by the serological examination of the strains. In all 5 the glove strains were identical with the superficial skin strains, and in 4 of the 5 the nasal strain belonged to the same serological type. The case in which the nasal strain differed from the glove and skin strain was peculiar. The volunteer was a double carrier at both surveys. The nasal strains of the two surveys were serologically identical, as were the skin strains; and it appears that we were dealing with a chronic nasal carrier of one strain and a chronic skin carrier of another strain. The source of the skin strain appeared to be a discharging chronic mastoid sinus of eight years' standing, from which a serologically identical strain was isolated.

TABLE VII—CONSTANCY OF THE NASAL-CARRIER STATE

First sampling	No.	Second sampling		
		+	−	Percentage unchanged
+	20	17	3	85 ± 8·0
−	20	6	14	70 ±10·2

Discussion

Staph. pyogenes was carried on the skin of the wrists by 19 per cent. of 159 hospital students. The relevance of this fact to the spread of surgical staphylococcal infection depends on the constancy of the carrier state. Transient infestation cannot be excluded, but the areas sampled are not those specially exposed to contamination from external sources. Serological tests identify six subtypes of *Staph. pyogenes*. Had the skin strains been of purely fortuitous origin, it is highly unlikely that correspondence between nose and skin strains would have been demonstrable in 23 of 27 double carriers. Evidence that the skin-carrier state is not superficial lies in the fact that in 15 skin carriers tested the hands of 5 were so deeply infested that *Staph.*

pyogenes survived scrubbing-up and spirit disinfection and were subsequently sweated in considerable numbers into sterile operation gloves.

There is an undoubted association of the skin-carrier state with the nasal-carrier state; the latter appears to be relatively constant, 17 out of 20 remaining nasal carriers three months later. The identity of serological types in most of the double carriers suggests that the one depends on the other. The nose is a likely source of the cocci. There is no other obvious reservoir except staphylococcal skin lesions, and there was no discoverable relation between the skin-carrier state and history of skin infection.

The 5 deep carriers were all double carriers by the superficial swabbing tests. There were 13 double carriers so tested, and, if we assume that 5 of every 13 double carriers are deep carriers, and that the 12·6 per cent. double-carrier-rate in the first survey is representative, we may estimate the incidence of the deep-carrier state on the hands as being of the order of 5 per cent. of the total student population tested. From the point of view of surgical risk this is probably a conservative estimate, for the gloves were tested immediately sweating began, usually after five to thirty-five minutes; had the sweating been prolonged for periods as long as the average operation, the incidence of deep carriers might have been higher.

It appears, therefore, that the persistent skin-carrier state in a surgeon reported by Devenish and Miles (1939) was not an isolated phenomenon but one which is relatively common. If it proves to depend on the nasal-carrier state, we may presume that the skin-carrier state is not uncommon, for in two recorded surveys (Hallman 1937, McFarlan 1938) the nasal-carrier-rate was of the same order as the 43 per cent. found in this investigation.

Conclusions

From a test of 159 students for potentially pathogenic *Staph. pyogenes*, in which serological typing was used to establish the relationship between various strains, the following conclusions may be drawn.

(1) The nasal-carrier-rate was 43·4 per cent. and the skin-carrier-rate 19·5 per cent. The double-carrier-rate was 12·6 per cent.

(2) The skin-carrier state depended on the nasal-carrier state, which in turn was associated with a history of chronic nasal disease.

(3) The infestation of the skin of the hands may be relatively deep-seated, for 5 of 13 double carriers excreted *Staph. pyogenes* into rubber gloves after routine surgical disinfection of the hands.

We wish to express our thanks to Dr. R. A. O'Brien, of the Wellcome physiological research laboratories, for a supply of staphylococcal toxin and antitoxin; to the students of University College Hospital medical school for their coöperation; and to Prof. A. A. Miles for his advice.

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PANCREATIC LITHIASIS

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Although less than 140 cases of pancreatic lithiasis are known to have been published since the condition was first described by de Graaf two hundred and seventy years ago, the condition is so grave that it should be borne in mind in making a differential diagnosis in the region of the upper abdomen. Its diagnosis is notoriously difficult; but, if it is recognised sufficiently early, surgical treatment in appropriate cases is eminently satisfactory, whereas failure to diagnose it usually leads to disaster. In fact the disease is one in which treatment has outstripped diagnosis. Hence the reporting of cases as they occur becomes almost a moral obligation. Moreover, the progressively increasing numbers reported year by year indicates that the disease is by no means so rare as is supposed.*

DIAGNOSIS

The following are the reasons for the difficulty in diagnosis.

(1) There is no pathognomonic symptom or sign of pancreas stones except their discovery in the stools, a rare event owing to their friability. Such symptoms as appear are those of chronic pancreatitis, which is always present either as cause or effect, and/or of other associated conditions, such as abscess, cholecystitis, and gall-stones;

(2) The symptoms of pancreatitis, though it is apparently very common, are so vague that it is seldom diagnosed. Such digestive disturbances as it causes are generally indistinguishable from those due to affections of neighbouring organs, which, moreover, frequently accompany it.

The only characteristic features are evidence of pancreatic insufficiency in fluid withdrawn from the duodenum and the finding of undigested fat and muscle-fibre in the stools. So-called pancreatic diarrhœa and extreme asthenia, out of proportion to the severity of other symptoms, with loss of flesh, are significant of destruction of pancreatic tissue and, when present, should help diagnosis. The stools are often bulky, grumous, and foul-smelling.

Pain, the most constant symptom of pancreatitis with or without calculus, is liable to be confused with that caused by gastric or duodenal ulcer, gall-stones, or renal calculi, all of which may be associated with it. The character of the pain is as variable as its location: dull, acute, or cholicky (actual colic caused by pancreas stones being indistinguishable from that caused by gall-stones); continuous or intermittent; coming on at intervals after food or having no relation to it, often with intervals of complete freedom lasting months or years. Its situation may be epigastric, umbilical, right or left hypochondriac, or lumbar, radiating in different directions—e.g., the back, either shoulder, scapula, loin, and iliac fossa—depending, Mayo (1936) suggests, on the position of the inflamed area in the pancreas.

Although more than thirty years ago Mayo Robson (1904) recognised the value of radiography in the diagnosis of pancreatic stones, owing to their usually high calcium content, Seeger (1928) could quote only one case in which up to 1926 a preoperative diagnosis had been made by their means. Robson was prob-

* In the more easily obtainable American and continental journals I have found 24 cases recorded during the period 1934-37.

ably speaking of comparatively large stones blocking the ducts or occupying abscess cavities, for he lays it down that "as soon as pancreatic stones are diagnosed they should be removed, as destruction of the pancreas is otherwise certain," a dictum which cannot apply to most cases, including that reported below. In Robson's day the opaque meal was unknown, and paradoxically this great advance in diagnostic radiography in the abdomen seems to have contributed more than anything else to the delay in the realisation of his expectation—e.g., in Hartman's (1925) third case of removal of pancreas stones the shadow thrown by a stone 2·5 cm. in diameter was interpreted as a duodenal ulcer, which proved to be non-existent, and in his fourth case the meal satisfactorily demonstrated duodenal ulcer but did not show the stone. In other words, the shadow of the meal had masked that of the stone in the one case partially and in the other completely.

There are other reasons of failure to diagnose calculi by radiography even at its present stage of development. The stones may be too minute to cast a shadow. Variation in calcium content, blurring of outline caused by aortic pulsation, and differentiation of their shadows from those cast by other objects, such as calcified glands, aortic calcareous patches, and biliary or even renal calculi contribute to this failure. Reliance on radioscopy alone has been another cause, but the chief cause, where fairly modern apparatus has been used, is probably the opaque meal. It has for some years been my own practice when seeking X-ray assistance in the diagnosis of abdominal cases, especially upper, to ask for a plain film to be taken *before* the meal is given. Much time may be saved and help given by this precaution, whether the findings are positive or negative. The annoying uncertainty is avoided as to whether or not a suspicious shadow is that of a lurking fragment of the meal, and at a subsequent operation, when obstructive jaundice may have been traced to a hard mass in the head of the pancreas, a negative film will rule out calculus and enable the surgeon at once to proceed accordingly.

Korte's remark made many years ago, to the effect that disease of the pancreas would be far commoner if the doctor only remembered that his patient had a pancreas, still applies, especially as regards calculus, and not only to the clinician but also to the radiologist and the surgeon. That this is so is shown by the increasing frequency with which the same individual has more than one case to his credit either successfully diagnosed or removed by operation.

In the Mayo Clinic it has been the custom for many years to explore the pancreas in all upper abdominal operations. Even so, however, without radiography stones may be missed. Owing to the consistence of the pancreas it may be impossible to detect them by palpation unless they are multiple and cause crepitation.

EFFECTS ON THE PANCREAS

Although calculi may lie quiescent apparently indefinitely, without causing symptoms, they are more likely to cause more or less extensive destruction of the pancreas, leading finally to fatty or fibroid degeneration or to the formation of cysts or abscesses. Abscesses may be multiple, or the pancreas may be converted into a bag of pus, even communicating by a fistulous opening with the stomach or the duodenum. The acinous tissue perishes first, the islands of Langerhans holding out almost to the end; hence glycosuria, when present, is a late symptom, while steatorrhœa and creatorrhœa may develop at an earlier stage. Even so, however, glycosuria is not of itself necessarily a bar to operation. A large area of the gland must be affected before obvious failure of function results. Indeed its complete destruction is not necessarily incompatible with continuance of life—even with fair health.

Provided destruction has been slow, other organs may take on the functions of the pancreas. Thus Opie (1910) refers to the case of a medical man whose stools for twenty years had contained fluid or solid fat, but who lived in good health till 90. At necropsy his pancreas was found to be almost wholly replaced by fat, the duct of Wirsung being completely blocked by a calculus. Vallery-Radot et al. (1933) report the autopsy of a man, aged 72, with two years' history of epigastric and right iliac pain and steatorrhœa, whose pancreas was entirely replaced by fat, a large stone lying in the duct and smaller ones being scattered throughout the gland, who nevertheless never had glycosuria.

ÆTIOLOGY

The ætiology of pancreatic lithiasis is still obscure. It is generally agreed that infective inflammation, whether by way of ducts, lymphatics, or blood-stream, and stasis of secretion are essential causal factors. Normal pancreatic juice contains no calcium carbonate, the chief constituent of calculi, but in the presence of inflammation some change presumably takes place in the process of secretion, resulting in its formation. Its frequent association with disease of the biliary tract points to a common cause.

Two types of stone are recognised: those formed within the ducts by precipitation on a nucleus, as in the kidney or the gall-bladder, and, when limited to the main or secondary ducts, referred to as localised; and those scattered throughout the gland. Mayo (1936) calls the latter, when lying in the parenchyma, "false stones," being a calcification of the inflamed tissue of the pancreas, such as is likely to happen in inflamed tissue elsewhere. It is in connexion with these that he considers disease in the biliary tract so important an ætiological factor. The duct stones, by causing obstruction, lead to interstitial pancreatitis by back-pressure and to further possible stone formation. There seems, however, to be some doubt as to whether, when scattered throughout the gland, as they are in most cases, they are formed in the gland tissue only or in the ultimate ductules as well. In Ackman and Ross's case (1932) stones of various sizes filled and blocked the main duct and its branches, minute ones being found in the remotest parts of the gland, but always in dilated duct radicles. In the case reported below the radiogram shows the stones fairly uniformly distributed throughout the gland, but those which caused trouble were obviously duct stones. Precipitation and calcification may take place together.

CASE-RECORD

A man, aged 76, had always enjoyed good health, except for what would be generally regarded as trivial ailments (see below). His urine was always normal when examined for insurance, and his arteries were free from any suspicion of atheroma. There was no history of syphilis, and the patient was always very abstemious as regards alcohol.

On March 10, 1929, he was seized, without warning, with epigastric colic, recurring in paroxysms of increasing intensity every few minutes and causing the most profound collapse. He was taken to a nearby nursing-home and seen by a doctor, who diagnosed gall-stone colic, a diagnosis with which I subsequently agreed. In spite of a hypodermic injection of morphia the paroxysms continued some hours and then suddenly ceased, and he left the nursing-home the next

morning feeling quite well, though a little tender in the epigastrium.

A fortnight later he had a recurrence, which, though less severe, required morphia. The attacks were repeated roughly at monthly intervals for the next fourteen months, becoming less severe and of shorter duration, until finally they lasted only ten to fifteen minutes and caused little more than discomfort with a feeling of faintness. They were never accompanied by jaundice or rise of temperature. On two or three occasions after the first attack search, though not very thorough, was made in the stools, but no stones were found. The patient located the pain deeply at a point 1 in. below the xiphoid cartilage and described it in the earlier attacks, especially the first, as though gas or fluid were being pumped into a small cavity, which threatened to burst.

A radiological examination was made by Dr. Gould Williams, then radiologist to the Swansea Hospital. The gall-bladder did not stain well, and as regards it the findings were inconclusive. The area of the pancreas was mapped out by innumerable small shadows (see figure). For this illustration and for other radiological examinations made since, in the course of which disease of the biliary tract was eliminated, I am indebted to Dr. Howell Davies, assistant radiologist to the hospital. The figure shows the condition today, the radiological picture being practically unchanged since 1929.

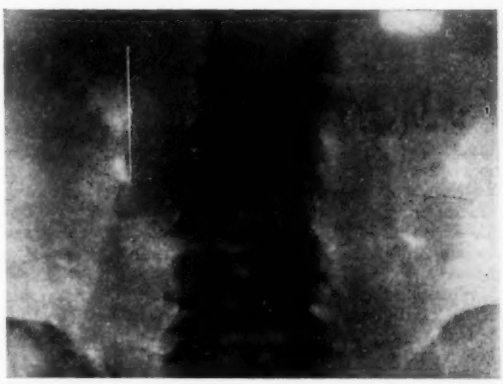
As regards treatment, in considering the question of operation after the fourth attack, it was assumed that calculi lying in one of the lobules of the pancreas were finding their way into the main duct and being successively discharged, and that, being of fairly uniform size, their passage at the duct outlet, owing to previous dilatation, was on each occasion becoming easier. It was consequently held that pancreatomy was not necessary. Similarly it was considered that there was not sufficient evidence of pancreatitis or of cholecystitis to call for biliary drainage. It was therefore decided to await events, a decision which appears to have been fully justified both by the absence of change in the radiological picture after nine years and by the fact that the patient has remained in excellent health not only during the period of recurrence of the attacks but also ever since.

The following details of the previous history are relevant.

At 16, immediately after a surfeit of strawberries—though the connexion was not at that time recognised—he developed what was evidently a virulent form of urticaria, accompanied by the sudden appearance of transitory swellings, mostly about the face. This lasted over twelve months, with intervals of only a few days, and then gradually disappeared. It was accompanied at first by acute indigestion, from which he had never previously suffered. It was always aggravated by pickles or anything containing vinegar.

At 33 he had a mild attack of painless jaundice, which lasted three or four weeks. At 43 he had a recurrence of urticaria, the so-called giant form, with severe angioneurotic œdema. It was accompanied by a troublesome flatulent dyspepsia and was aggravated by the same articles of food as before, but also by soft fruits, especially strawberries, and, he thought, by wines. Shortly before the onset he had taken up motoring, and it soon became obvious that the urticaria was aggravated as much by driving long distances as by foodstuffs. In spite, however, of giving up the wheel and avoiding all articles of diet which he knew to be nocuous, he was seldom free from it, and after some eighteen months, when his working capacity was becoming seriously affected, mainly through want of sleep, it was suggested that possibly deficiency of serum-calcium was the cause of the trouble.

The calcium content of the blood was investigated by the then recognised method, and clotting-time was found to be double the normal. The administration of calcium chloride in large doses was followed by immediate and complete relief and normal clotting-time. To maintain this, however, to keep free from urticaria, and at the same time to resume ordinary diet, including soft fruit, salads, and cucumber, with the usual vinegar dressing, of which he was particularly fond and had been so long deprived, he found it necessary to take calcium regularly. Besides a diet in which dairy produce figured very largely he took gr. 90–100 of calcium lactate daily for eight months or more, long after the final disappearance of the urticaria, and, in the belief that it was harmless, continued it as a prophylactic at short intervals for the next four years. Meanwhile the flatulent dyspepsia, which had previously defied treatment, yielded to simple remedies within two months of starting the treatment.



Radiogram of diffuse lithiasis of pancreas. Patient recumbent; the body and tail of the pancreas are at the level of the first lumbar vertebra; and the head of the pancreas is mainly to the right of the second lumbar vertebra and the intervertebral disk above.

Since then he has remained in excellent health, apart from the attacks of colic twenty-five years later, which led to the discovery of the calculous deposits in the pancreas.

Although the clotting-time test alone may not now be regarded as sufficient proof of excess or deficiency of serum-calcium content, all the foregoing facts being taken into consideration, there can be little doubt that he was at the time of his second attack of urticaria the subject of hypocalcæmia. Moreover, from the rapidity with which a few doses of calcium salts were followed not once but repeatedly by immediate relief, though at first only temporary, it is evident that the rate of absorption of these was abnormally high and their influence in raising the blood-calcium level for the time being correspondingly great. Further it seems that the hypocalcæmia was not only corrected but also over-corrected and the resulting hypercalcæmia maintained for at least several months, the period certainly overlapping that during which he was still troubled with dyspepsia.

It will be seen, therefore, that the conditions which obtained at this time were precisely those by means of which experimental hypervitaminosis D is brought about in animals, as described by Gillespie (1935), and it is reasonable to assume that it was now that the calcium deposits were laid down in the pancreas. Hypervitaminosis D is produced by administering excessive quantities of vitamin D together with large quantities of calcium, with the result that excessively large quantities of the vitamin and of calcium are absorbed from the intestine, causing hypercalcæmia and local metastatic calcification. The condition is similar to the not uncommon metastatic calcareous deposits in arteries, lung, kidney, and stomach wall in

No. 17 vol 2

generalised osteitis fibrosa, also probably the direct result of hypercalcæmia. Assuming that the dyspepsia was of pancreatic origin—i.e., associated with a catarrhal pancreatitis, according to Weiss (1935 extremely common—the determination of the calcareous deposit to the pancreas is still more readily explained. Had he been the subject of tuberculosis or of thyroid disease, the deposits would presumably have affected the lungs, lymphatic glands, thyroid, or other organs instead of the pancreas.

It might be argued that, according to the history, there were at least two other occasions when the deposits might have been laid down—namely, at 17, when he suffered from urticaria and acute indigestion, and at 33, when he had an attack of catarrhal jaundice. As regards the former, if there had been any variation in the serum-calcium content, it would presumably have taken the same form as in the second attack—i.e., hypocalcæmia—and there was no occasion given for the supervention of an induced hypercalcæmia. Although a pancreatic catarrh might have been associated with the catarrhal jaundice at 33, there were no accompanying dyspepsia or other symptom to indicate this.

Without falling into the error of arguing from a single case that hypercalcæmia is an essential ætiological factor in pancreatic lithiasis, such a thesis receives support from experiments carried out by Loeper, Bioy, and Perreau (1936). The pancreas being part of the apparatus for the elimination of calcium from the body, the calcium content of the secretion naturally varies. The object of the investigation was to ascertain the proportion of a sudden increase in the calcium-content of the blood which is eliminated by the pancreas. Injection of calcium chloride and gluconate into the veins of animals was found to be immediately followed by a 30 per cent. increase of calcium in the pancreatic juice. Hence, while hypercalcæmia under favourable conditions—e.g., inflammation—may lead to calcification of the parenchyma, the increase in the calcium content of the excretion would also cause the same tendency as regards the formation of calculi in the ducts.

Fortunately, pathological conditions characterised by hypercalcæmia are rare; otherwise, should the theory here advanced prove correct, pancreatic lithiasis would be far commoner than it is. It should be added that recent examinations of the patient's blood show the calcium content to be normal.

SUMMARY

(1) The difficulty in the diagnosis of pancreatic lithiasis is due to the absence of any pathognomonic symptom or sign, except the discovery of pancreas stones in the stools (which is rare, owing to their friability), and to the accompanying pancreatitis.

(2) The only characteristic features are evidence of pancreatic insufficiency in fluid withdrawn from the duodenum and the presence of undigested fat and muscle-fibre in the stools.

(3) The difficulties of recognising pancreas stones radiologically are explained. A plain radiogram should always be made before giving a barium meal.

(4) A case is reported in which it is believed that an induced hypercalcæmia played an important part in the formation of calculi.

I must acknowledge the help which I have received from Dr. A. F. Sladden, director of the Beck Laboratory, in discussing with him various points arising in this article, and in recently examining the patient's blood, when he found the calcium content normal.

References at foot of next column

VITAMINS D_2 AND D_3 IN INFANTILE RICKETS

A COMPARISON OF THEIR THERAPEUTIC EFFICIENCY

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VISITING PHYSICIAN TO THE CHILDREN'S DEPT. OF THE HOSPITAL

FOR some years attempts have been made to show that the source of vitamin D is an important factor in determining its antirachitic potency in the human subject. The concentration of this vitamin in any substance is estimated by its action in preventing and curing rickets in rats fed on a rachitogenic diet. The late Dr. Alfred Hess was one of the chief exponents of the view that the rat method of assay was not necessarily an accurate indication of the relative efficiencies of various methods of supplying vitamin D. Hess and Lewis (1933) stated that irradiated milk was more valuable than either cod-liver oil or irradiated ergosterol as a therapeutic agent in human rickets, even when all three were given in amounts containing the same number of international units (I.U.)—i.e., in doses equipotent for the rat. The more carefully controlled investigations of Eliot et al. (1936) have not demonstrated any such difference. With the introduction of vitamin D_3 further efforts have been made to determine the relative potencies of the various types of vitamin D.

ANTIRACHITIC POTENCIES OF VARIOUS FORMS OF VITAMIN D (figures after Brockmann 1938b)

Vitamin	Derived from—	International units per mg. (rat assay)	Protective dose for chicken rickets
D_2	Ergosterol	40,000	12·0
D_3	7-Dehydrocholesterol ..	40,000	0·2
D_4	22-Dehydroergosterol ..	30,000	1·0
D_5	7-Dehydrositosterol ..	1200	360·0

Bills points out that the properties of vitamin D are exhibited by ten different sterol derivatives. Mention may be made of the four vitamins, D_2, D_3, D_4, and D_5, for which experimental data are available indicating their different potencies when tested on rats and chickens. (It will be noted that there is no D_1, which term was used for a lumisterol-calciferol mixture originally thought to be the pure vitamin.) From the practical point of view at present only two need be considered—vitamins D_2 and D_3. D_2, better known in this country as calciferol, is formed by the irradiation of ergosterol, a substance which is essentially a constituent of the sterols of plants, although its

MR. BROOK: REFERENCES

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presence has also been demonstrated in eggs (Windaus and Stange 1936). Vitamin D_3, on the other hand, has as its provitamin 7-dehydrocholesterol, which has been isolated from animal sterols and is present in relatively high concentration in tunny-liver and halibut-liver oils. In 1937 Schenck, working in the laboratory of Windaus, announced his success in preparing crystalline vitamin D_3, which was found to have a potency of 40,000 I.U. per mg., establishing the equal antirachitic potencies of vitamins D_2 and D_3 when tested on rats. For chicks, however, Grab (1936) found D_3 much more effective than D_2.

As regards the relative efficiency for the human infant, Hume (1936–37), after reviewing the recorded data up to 1936, states that "the conclusion seems fairly certain that for the human infant vitamin D from fish-liver oils, irradiated ergosterol, irradiated cholesterol and vitamin D milks of various kinds has the same relative potency as for rats." In the past three years, however, some fresh studies with infants have appeared.

Lewis (1937) found that irradiated ergosterol was less powerful than cod-liver oil or percomorph-liver oil, both of which contain vitamin D_3. Drake (1937) stated that irradiated cholesterol (D_3) was superior to irradiated yeast (D_2). Burchard (1937) maintained that the preparation commonly used in Germany was more potent than an amount of D_2 containing the same number of international units and attributed this to the fact that the D vitamin of Vogan was D_3.

From these results one cannot, however, deduce that D_3 is superior to D_2 in the treatment of human rickets, for the fish-liver oils and vogan may and probably do contain other active substances. The preparation of crystalline vitamin D_3 makes it possible to use the pure vitamin in clinical assays.

Brockmann (1937) used vitamin D_3 in the successful treatment of 21 infants with florid rickets; he gave doses of 0·02 or 0·01 mg. per kg. of body-weight daily —i.e., not less than 4000 I.U. a day. But, on the assumption that the minimal curative dose of vitamin D_2 is 0·2 mg. (8000 I.U.) daily, he concluded that D_3 had twice the potency of D_2. Unfortunately a similar group of infants were not given vitamin D_2.

Hartenstein (1937) found, in a series of 11 infants, that the daily administration of 0·15 mg. of D_3 (6000 I.U.) led to clinical, radiological, and biochemical signs of healing within two weeks. In a later investigation (Hartenstein 1938), using single doses of 7·5 mg., he obtained better results with D_3 than with D_2, for 7 of the 10 patients who were given D_2 required much longer treatment.

Harnapp (1936) showed, in 11 rachitic infants, that a single dose of 7·5–15 mg. of D_3 led to satisfactory healing, and he stated that the rate of healing was more rapid than with D_2. Jacoby (1938), on the other hand, comparing the results of single massive dosage (10–15 mg.) of vitamins D_2 and D_3 in groups of 22 and 24 children, found no difference between the effects either on the changes in the radiograms or in the levels of calcium and phosphorus in the serum.

Brockmann (1938a) has also obtained the same results with single large doses, but stated that only with minimal amounts of the vitamin could the superiority of D_3 be detected. Nadrai (1939a), however, using D_2 and D_3 in amounts of 5–12·5 mg. injected intramuscularly to obviate errors in absorption, could detect no difference in the therapeutic effects of the two vitamins.

Bischoff and Brieger (1938) found, in a series of 50 infants with rickets and spasmophilia, that D_2 and D_3 were equally effective, but that the signs of healing appeared sooner with a single large dose than with smaller daily amounts. Steinbrück (1938) gave 0·12–0·15 mg. of D_3 (4800–6000 I.U.) daily to 34 infants with rickets, and the same doses of D_2 to another group of 6 infants without observing any difference in the rates of healing.

It is clear that the clinical investigations so far recorded are by no means unanimous as to the relative potencies of D_2 and D_3 in the treatment of rickets in the infant.

PRESENT INVESTIGATION

In the present study an attempt has been made to compare the potency of crystalline vitamins D_2 and D_3. The real difficulty of the assay was to make certain that the only variable was the vitamin. The diet was a milk-mixture consisting of milk two-thirds, water a third, and sugar and oatflour in amounts suitable for the age of each patient. The infants were kept together on the same side of the ward out of direct sunlight. So far as possible, infants of the same age were used for comparison. Although we could not start the investigation on the same date in each pair, in most instances we obtained suitable subjects of approximately the same age and weight for comparison at times fairly close to one another. Every patient was kept in the ward for at least three weeks before the vitamin was administered, to ensure as far as possible that the rickets had not begun to heal before specific antirachitic therapy was instituted.

Dosage.—There is considerable difference of opinion as to the optimal dosage of vitamin D required for the cure of rickets in the infant.

Shelling and Hopper (1936) believe that it is 3000–4000 I.U. daily. Park (1938) suggests 1200 I.U. as a curative dose for the ordinary case of rickets, but states that this amount may have to be increased for premature and older children and when the rickets is severe. In many German clinics, on the other hand, a dose of 8000 I.U. is considered necessary (Brockmann 1938b).

In the present investigation it was felt that any differences in the effects of D_2 and D_3 would be best detected if the dosage were on the low side. Since ordinarily a patient with rickets would almost certainly be receiving some antirachitic factor either in the diet or by natural ultraviolet irradiation, it was felt that a dose of 2000 I.U. a day was on the low side for curative purposes. This amount was given to each patient, irrespective of age and weight. Accordingly the dosage varied in each pair from 140 to 286 I.U. per kg. of body-weight daily. Olive-oil solutions of vitamins D_2 and D_3 were obtained from the National Institute of Medical Research.

Detection of healing.—First we attempted to determine the time taken for the earliest sign of healing to appear. Secondly it was hoped to obtain some idea of the rate of healing. The methods available for the diagnosis of healing are clinical, radiological, and biochemical. Clinical observations are not nearly accurate enough for the purposes of this investigation. Radiology provides a satisfactory method for the detection of the earliest sign of healing. Radiograms of the patients were made at intervals of a week before and after the administration of vitamin D began. They were reported on immediately by the radiologist, Dr. Balfour Black, who had no knowledge of the nature of the vitamin given to the particular child. Biochemical data are of considerable value in providing figures for comparison. The two substances likely to yield helpful information are inorganic serum-phosphate and plasma-phosphatase. Since many of the patients were babies and it was necessary to obtain weekly analyses of the blood, it was decided to use the plasma-phosphatase rather than the serum-phosphate.

On the whole, the evidence goes to show that serial estimations of phosphatase give a more accurate index of the rate of healing (Morris, Stevenson, et al. 1937).

FIG. 1

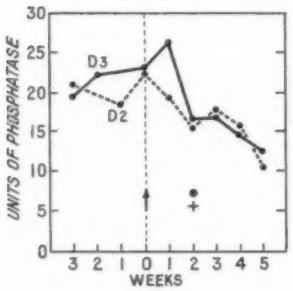
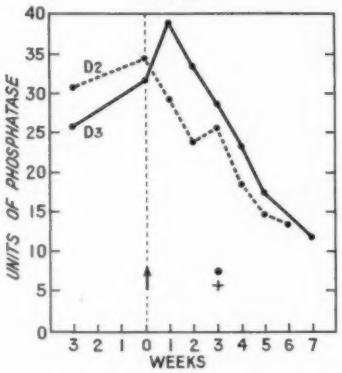


FIG. 2



DATA FOR FIGS. 1–5

Fig.	Vitamin	Age of patient (months)	Date of commencing vitamin therapy
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	D_3	14	,, 28, ,,
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+ Commencement of healing D_2
• ,, ,, ,, D_3
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In the event of tetany there is a rise of serum-phosphate which might lead to a fallacious interpretation, especially if the spasmophilia were mild. Plasma-phosphatase, increased during rickets, diminishes as healing takes place. The initial reduction takes place about the same time as signs of healing appear on the radiogram. It is certain that healing has begun before it is shown by either the radiograms or the plasma-phosphatase value. Probably the earliest sign of healing is an increased retention of calcium and phosphorus, which takes place in most infants within a week of the administration of antirachitic factor. It was impossible for several reasons to study such retention; so we had to depend on the radiograms and plasma-phosphatase values, between which there was little discrepancy.

Some idea of the rate of healing in each case was given by the rate of fall of the plasma-phosphatase. In this connexion it is important to remember that variations in the plasma-phosphatase value are due to factors other than rickets. In our opinion the level of plasma-phosphatase largely depends on the demand of the bone cells for calcium (Morris and Peden 1937). If insufficient calcium is being retained, the plasma-phosphatase value will rise, provided that the bone cells are active and an attempt is being made at growth. Should the growth stimulus for any reason be defective, the plasma-phosphatase will fall in value, and indeed the radiogram may give the picture of healing rickets, merely because the demand for calcium has been reduced below the small amount retained. It is obvious, therefore, that the rate of fall of plasma-phosphatase depends not only on the action of vitamin D but also on the amount of growth. It is for this reason that, in the evaluation of two forms of vitamin D, care should be taken to compare them in children of the same age, so that as far as possible the amount of growth should be the same.

In spite of all these precautions there are instances which are very difficult to explain. For instance, female twins, aged 16 months, were admitted to the children's ward in Stobhill Hospital, both of them presenting the typical appearance of rickets. Both had been brought up at home and had been bottle-fed on identical milk-mixtures. They seemed on admission to be ideal subjects for a comparative study of vitamins D_2 and D_3, but radiography revealed active rickets in one and an advanced state of healing in the other. Plasma-phosphatase values corroborated these findings, being 23·5 units in the child with active rickets and 7·6 in the other.

Biochemical and radiological findings were obtained from 10 pairs of children, and radiological data alone from 1 other pair. Illustrative charts showing the rate of fall of plasma-phosphatase in 5 pairs of children are given (figs. 1–5). The members of each pair were approximately of the same age, and the tests were carried out at the same time of year. This latter point is of considerable importance, for the rate of healing varies at different times of the year. Thus, in June, during a short period of very good weather, we found that infants who had the radiological and biochemical signs of active rickets on admission showed evidence of fairly rapid healing within three weeks, although they were receiving no special vitamin-D therapy and were kept on the shaded side of the ward. This further emphasises the necessity for watching a patient for at least three

FIG. 3

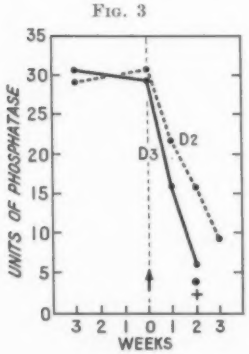


FIG. 4

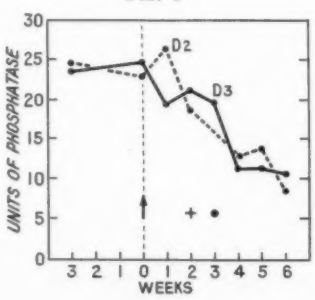
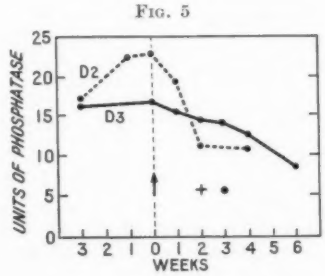


FIG. 5



weeks, to make certain that healing has not begun without specific treatment.

Results.—The time taken for signs of healing to appear in the radiogram shows little if any variation, and the rate of fall in plasma-phosphatase value is almost identical in the two groups. In 3 patients treated with D_3 and 1 with D_2 there was a transient rise in plasma-phosphatase a week after the start of vitamin therapy. Hottinger (1929) and Morris, Graham, and Ford (1935) have shown that occasionally there can be detected in patients given vitamin D a transient fall in the retention of lime and phosphorus, followed by a considerable increase. The rise in plasma-phosphatase might well be due to the "negative phase" of calcium retention, if, as we believe, the level of phosphatase depends on the ratio of the calcium requirement of the bone cells to the supply.

The results show clearly that, so far as this investigation is concerned, there is no significant difference between the therapeutic effects of vitamins D_2 and D_3 on the rachitic infant and child. Nadrai (1939b) has published the details of a child, aged $4\frac{1}{2}$, successfully treated with a massive dose of vitamin D_3 and infers that this form of vitamin may be specially useful in late rickets. It is the general experience that late rickets usually reacts well to the exhibition of a calciferol (vitamin-D_2) concentrate, but that resistant forms of rickets are occasionally met which require prolonged treatment with large doses. Even with vitamin D_3 cases may prove refractory, as is evident from the report of Brockmann (1938a), who mentions two patients not responding to 15 mg. and a third who did not heal satisfactorily after [illegible] dose.

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SUMMARY

The course of healing in 12 infants and children with active rickets was studied by serial radiography of the wrists and by estimation of the plasma-phosphatase, 6 patients being given vitamin D_2 and 6 vitamin D_3 in amounts equivalent to 2000 I.U. daily.

The results revealed no significant difference between the therapeutic effects of these two vitamins on rachitic infants and children.

This investigation was carried out at the request of the Therapeutic Trials Committee of the Medical Research Council. We acknowledge our indebtedness to Sir Henry Dale and Mr. C. Webster for supplying us with the vitamins, to the Medical Research Council for an expenses grant, to Dr. W. Martin, medical superintendent of Stobhill Hospital, for granting us facilities, and to Sisters Jack and Provan for their coöperation.

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EFFECTS OF DRUGS IN MYOTONIA

BY E. GUTTMANN, M.D. Munich

AND

A. B. STOKES, B.M. Oxfd, M.R.C.P., D.P.M.

(*From the Maudsley Hospital, London*)

THE work of Foster Kennedy and his collaborators on the contrasting effects of quinine and Prostigmin in cases with myotonia and myasthenia suggested an investigation of the following case.

CASE-RECORD

A male, aged 20, complained of "stiffness of every muscle of his body" that prevented muscular relaxation, difficulty in sustaining forceful effort, and difficulty in accommodating himself to sudden changes of movement. There was no history of any relation having been similarly affected. His father and mother have a common ancestor in the sixth generation from the patient. There are five siblings, all of whom are unaffected.

History of present condition.—He has noticed his condition as long as he can remember, but only since the age of 16 has he realised that he is different from other people. He has attended various hospitals and seen numerous doctors and osteopaths, none of whom has produced any benefit. The condition has not progressed, and he has been able to lead an ordinary life, except for certain restrictions. His ability to play games has been interfered with, and he has had considerably to curtail dancing and driving a car. Apart from the difficulties of muscular effort, he has no other physical symptoms, and his past medical history has been uneventful.

The patient has always adapted himself very well to his physical surroundings. He is cheerful and intelligent, has a good school record and is making excellent progress in his work as a draughtsman. He is not hypochondriacal, although naturally anxious for treatment with belief in the possibility of cure.

He was admitted to the Maudsley Hospital on May 27, 1932, for a short period of observation, and his condition was diagnosed as myotonia congenita (Thomsen's disease). No treatment was instituted.

The patient was again examined on Sept. 9, 1936, when his condition was the same as before. An examination of the central nervous system revealed no abnormality, apart from the muscular phenomena. His pupillary reaction to light was delayed, but there was no abnormality of movements of the external ocular muscles. On forceful closure of the eyes the frontalis muscles had to be brought into action in

PROF. MORRIS & DR. STEVENSON: REFERENCES (*cont.*)

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FIG. 1

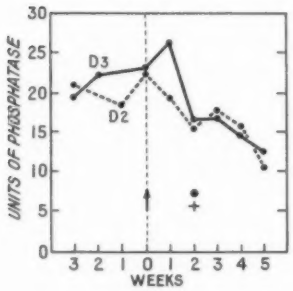

FIG. 2

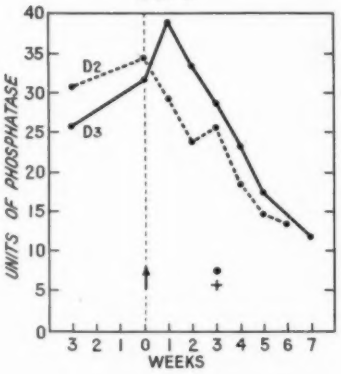

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Fig.	Vitamin	Age of patient (months)	Date of commencing vitamin therapy
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In spite of all these precautions there are instances which are very difficult to explain. For instance, female twins, aged 16 months, were admitted to the children's ward in Stobhill Hospital, both of them presenting the typical appearance of rickets. Both had been brought up at home and had been bottle-fed on identical milk-mixtures. They seemed on admission to be ideal subjects for a comparative study of vitamins D_2 and D_3, but radiography revealed active rickets in one and an advanced state of healing in the other. Plasma-phosphatase values corroborated these findings, being 23·5 units in the child with active rickets and 7·6 in the other.

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FIG. 3

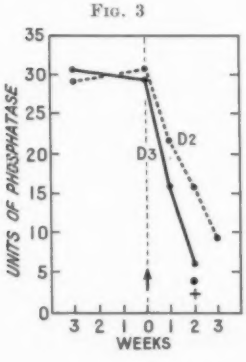


FIG. 4

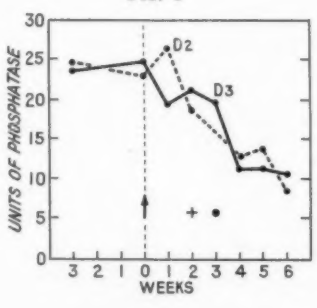
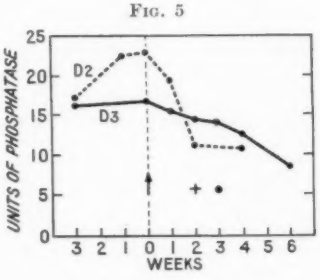


FIG. 5



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In this connexion the inhibitory effect of infection on many therapeutic measures, including the administration of vitamins, must always be kept in mind. In the present series a careful examination was made for any signs of infection, and, if they were found, the child was not considered suitable for the purposes of the investigation. Folberth (1937) states that vitamin D_3 overcomes to a greater degree than D_2 the inhibitory effect of infection. This may be so, but we feel that a larger series of cases must be examined before this can be confirmed. Doubt indeed is cast upon the superiority of D_3 in infections by the results of Nadrai (1939b), who investigated a series of 14 rachitic infants with pneumonia; 8 received vitamin D_3 and 6 vitamin D_2, but no difference was observed in the course of the disease in the two groups.

SUMMARY

The course of healing in 12 infants and children with active rickets was studied by serial radiography of the wrists and by estimation of the plasma-phosphatase, 6 patients being given vitamin D_2 and 6 vitamin D_3 in amounts equivalent to 2000 I.U. daily.

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THE work of Foster Kennedy and his collaborators on the contrasting effects of quinine and Prostigmin in cases with myotonia and myasthenia suggested an investigation of the following case.

CASE-RECORD

A male, aged 20, complained of "stiffness of every muscle of his body" that prevented muscular relaxation, difficulty in sustaining forceful effort, and difficulty in accommodating himself to sudden changes of movement. There was no history of any relation having been similarly affected. His father and mother have a common ancestor in the sixth generation from the patient. There are five siblings, all of whom are unaffected.

History of present condition.—He has noticed his condition as long as he can remember, but only since the age of 16 has he realised that he is different from other people. He has attended various hospitals and seen numerous doctors and osteopaths, none of whom has produced any benefit. The condition has not progressed, and he has been able to lead an ordinary life, except for certain restrictions. His ability to play games has been interfered with, and he has had considerably to curtail dancing and driving a car. Apart from the difficulties of muscular effort, he has no other physical symptoms, and his past medical history has been uneventful.

The patient has always adapted himself very well to his physical surroundings. He is cheerful and intelligent, has a good school record and is making excellent progress in his work as a draughtsman. He is not hypochondriacal, although naturally anxious for treatment with belief in the possibility of cure.

He was admitted to the Maudsley Hospital on May 27, 1932, for a short period of observation, and his condition was diagnosed as myotonia congenita (Thomsen's disease). No treatment was instituted.

The patient was again examined on Sept. 9, 1936, when his condition was the same as before. An examination of the central nervous system revealed no abnormality, apart from the muscular phenomena. His pupillary reaction to light was delayed, but there was no abnormality of movements of the external ocular muscles. On forceful closure of the eyes the frontalis muscles had to be brought into action in

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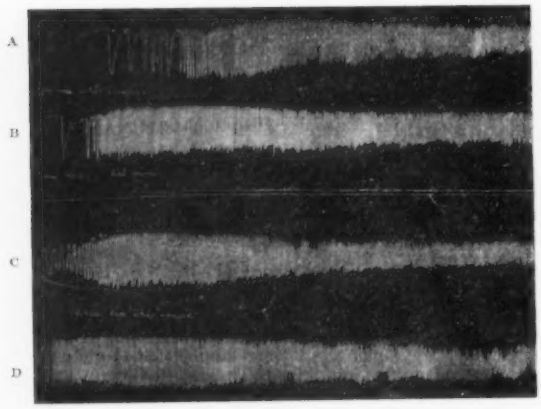

FIG. 1—Ergograph records before and after a single dose of quinine hydrochloride: (A) right hand before; (B) left hand before; (C) right hand after; (D) left hand after. Reduction of myotonia, allowing for "practice effect." Fatigue delayed.

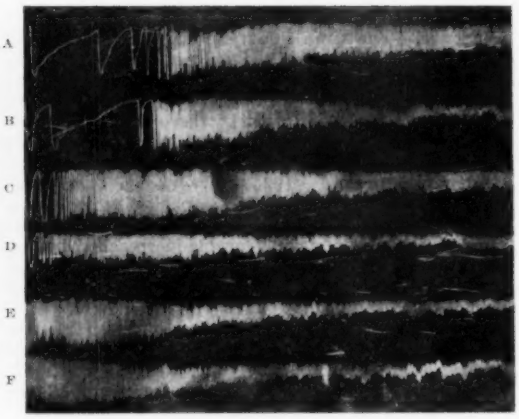

FIG. 2—Ergograph records after prolonged administration of quinine hydrochloride gr. 10 daily: (A), (C) and (E) right hand; (B), (D) and (F) left hand. Early reduction of myotonia with "practice."

the effort of reopening the lids. The jaw muscles in closure showed myotonia, and retraction of the tongue was difficult after protrusion. The muscles of the upper limb most affected were the trapezius, deltoid, pectorals, and flexors of the fingers. The hand grasp was characteristic, with flexion of the wrist to enable release. The extensors of the fingers were scarcely affected. In the legs the glutei and extensors of the knee were chiefly involved. The muscles of respiration were slightly affected, and after forced inspiration expiration was a little delayed. The recti abdominis showed myotonia, but the back muscles were not involved.

There was no clear evidence of dystrophy. The patient had a somewhat delicate skin with a boyish physique. The genitalia and secondary sex characters were well developed. The left sternocleidomastoid muscle was doubtfully smaller than the right. There was flattening of the lateral part of both thenar eminences, and the calf muscles were prominent. These features have been interpreted by Maas (1937) as evidence of dystrophia myotonica, but the interpretation must remain equivocal.

INVESTIGATION

Technique.—The finger movements in flexion and extension were selected for recording, because the myotonia was maximal in the flexor muscles and almost absent in the extensors. A Mosso's ergograph was used, with a small weight (12 oz.) to keep the string taut. The patient was instructed to flex his finger from the horizontal as quickly as possible and to repeat the movement as rapidly as possible after active extension. This repetition was maintained until fatigue was obvious. A lever recorded the movements on a slowly moving smoked drum. The difficulty of reproducing the same fatigue curve from the same person at different times is well known to everyone who has worked with this time-honoured apparatus. Nevertheless, recent investigations, such as that by Alcock and Carmichael (1938), have shown that the method is well workable, if its limitations are kept in mind. In particular the difficulty of duplicating the leverage conditions on different occasions is considerable. In interpretation of the curves the extent of excursion was therefore neglected from day to day, the form of relaxation and the onset of fatigue on the same day being regarded as of greater significance. It was found, further, in connexion with these experiments carried out on the same day, that the effect of repetition and continuation of the movements was a factor of great importance in interpretation ("practice effect"). After the first period of effort the initial myotonia was much reduced without being influenced by any drug.

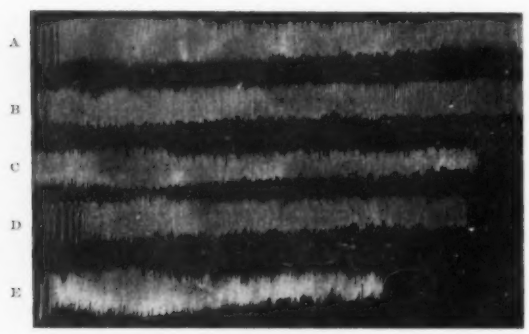

FIG. 3—Ergograph records before and after prostigmin: (A) left hand before; (B) and (D) right hand after; (C) and (E) left hand after. No reduction of myotonia with "practice" after 40 min. Early fatigue.

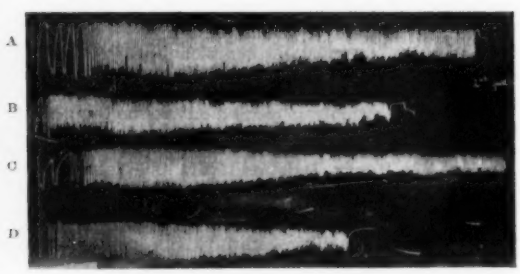

FIG. 4—Ergograph records after benzedrine: (A) right hand 10 min. after; (B) left hand 10 min. after; (C) right hand 55 min. after; (D) left hand 55 min. after. No improvement.

Periods of medication and subjective response.—From Sept. 23 to Dec. 26, 1936, the patient was given quinine hydrochloride gr. 10 daily in 5 gr. capsules. There was no untoward effect of this dosage. He felt very much more buoyant and less stiff, and particularly noted improvement in such acts as getting upstairs. His parents also noted the improvement. He was very pleased, inasmuch as this treatment was the first which had ever produced a beneficial effect.

From Dec. 26, 1936, to Jan. 28, 1937, the patient was given apparently similar capsules containing inert powder. He stated that improvement was maintained until Jan. 1. After that date he felt very much more stiff, was more awkward in getting up from the table, and on getting out of his train had to stand still on the platform. He was not disheartened at first at the apparent failure of the treatment, attributing the set-back to a slight cold he had at that time. By Jan. 28 he was, however, definitely despondent, complaining of stiffness of the face, and stiffness of his tongue on starting to talk and eat. He could not enjoy the season's festivities—e.g., dancing—because of his disabilities.

From Jan. 28, 1937, he has been receiving continuous treatment with quinine hydrochloride usually taking gr. 10 daily, sometimes gr. 15. The higher dosage causes hissing in the ears. He has reported continued relief, strongly contrasted with renewed disability on those occasions when he has not taken quinine. He finds it easy to drive a car, which previously he would not undertake because of the difficulty with such movements as looking behind when reversing. He can dance and play tennis vigorously. The stiffness has not left him completely, but he can shake off the initial stiffness more easily, and the stiffness of fatigue does not come on so early. In January, 1939, the quinine was still producing its "miraculous" effect.

Objective findings with the ergograph.—Quinine medication in continuous dosage and in a single large dose produced little effect on initial relaxation, but fatigue was less easily induced. The "practice effect" in overcoming the myotonia was induced earlier (see figs. 1 and 2).

The effects of intramuscular injections of prostigmin 0·001 g. are shown in fig. 3. Slight "practice effect," which is not maintained, is demonstrated in curves A, C, and E (left hand). The right hand, not tested before the injection, shows no improvement as compared with previous experiments (B); the practice effect in improving the curve is absent, and the performance in the second test (D) is worse than in the first (B).

The administration of Benzedrine (Amphetamine) 20 mg. by mouth was associated with a vigorous behaviour response and a rise of blood-pressure (95/65 contrasted with 115/72 after fifty-five minutes). The ergographic record did not show improvement; if anything, there was a lessening of "practice effect" and earlier fatigue (fig. 4).

DISCUSSION

The clinical observations of Kennedy and Wolf (1937) were confirmed in our case and the value of quinine medication graphically recorded. The experiments with other drugs suggest the following considerations, keeping in mind that the disturbance from which the patient suffers is his inability to overcome the abnormal tonic state of his muscles, even with voluntary effort.

Prostigmin affects the skeletal muscle. The curves show that this peripheral action cannot reduce the myotonia; if anything, the performance is worse. In the dosage given, prostigmin has no effect on motor centres. Benzedrine, on the other hand, causes cerebral stimulation, which in our case was clearly noticeable as euphoria, increased talkativeness and increased activity. Nevertheless, the performance registered on the ergograph did not improve. The effect of prostigmin is generally parasympathicomimetic and that of benzedrine sympathicomimetic; neither drug, in therapeutic doses, improves the myotonia.

Quinine, in relatively small doses, has an obvious effect on the myotonia. Considering the dose and the negligible auditory-vestibular symptoms, a central action or a vestibulo-vegetative reflex is not likely to be responsible. Briscoe (1939) has shown that, as regards the normal skeletal muscle, quinine is antagonistic to prostigmin and exercises its effect both by raising the threshold of the motor end-plates and by direct action on the muscle-fibres. Our clinical observations agree well with her experimental findings. The question of which peripheral factor is of more importance in the relief of the myotonia remains unanswered.

We wish to thank Prof. E. Mapother for allowing us to use this case and Dr. Aubrey Lewis for his interest and criticism.

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CONTROL OF GASTRIC ACIDITY IN PEPTIC ULCER

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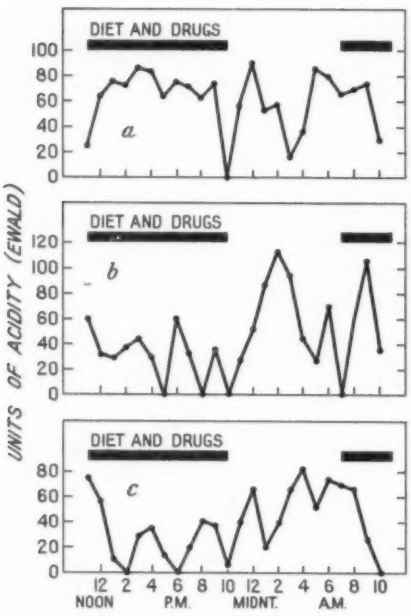
FOR all patients with peptic ulcer and hyperacidity it is customary to advise a strict dietary regime on the lines advocated by Sippy (1915) and Hurst (1929). The result claimed for such diets is the complete neutralisation of all the acid secreted by the stomach during the waking hours. Since hourly feeds and intermediate doses of alkalis, atropine, and olive oil are often irksome and unpleasant to the patient and cause considerable trouble to the nursing staff, it is obviously desirable to know whether the effects claimed by the advocates of these measures are obtained or not.

The argument that these complicated schemes of diet are justified by their good results is not sound, for it has long been recognised that the symptoms of uncomplicated peptic ulcer often rapidly disappear and healing takes place when the patient is rested in bed, whether or not strict dietetic treatment is used. It would be necessary to submit statistics showing that the percentage of cures is higher than that offered by other dietetic schemes which are simpler and more pleasant. Equally good immediate results are claimed for many diets which differ from one another in regard to both their constituents and the interval between feeds.

In view of these observations, and since hyperchlorhydria is believed by many to be the essential factor in preventing healing of ulcers, an investigation has been carried out to determine the effect of diet, alkalis, and atropine in the control of gastric

FIG. 1



acidity. Further, a series of patients has been treated by rest in bed as the sole therapeutic measure, and satisfactory healing has been found in many of them. These findings will be reported later, this communication dealing only with the control of gastric acidity by the diets and drugs now most commonly employed.

Method employed.—Estimations of gastric acidity have been made over 24-hour test periods, samples of gastric contents being removed for titration just before feeding or between feeds at intervals of ¼, ½, or 1 hour. Töpfer's reagent and phenolphthalein were used as indicators for free and total acid respectively. The diets tested are shown in table I, together with the standard amounts of atropine, olive oil, and alkaline powder used.

EFFECT OF DIFFERENT DIETS

In duodenal or gastric ulcer associated with hyperacidity it has been found impossible to obtain complete neutralisation of the gastric contents by any of the diets tested, either alone or in combination with atropine or alkaline powder in the standard doses described (table I).

Fig. 1 shows the 24-hour curves of free gastric acidity in a patient with uncomplicated duodenal ulcer on the hourly (*a*), two-hourly (*b*), and light diets (*c*), the standard amounts of atropine and alkalis recommended by Hurst being added to each diet. For purposes of comparison the average figure for free acidity has been calculated for the twenty-four specimens in each curve. There is little difference between the mean acidity for the two-hourly and light diets, but both give a considerably lower figure than the hourly diet. Table II gives the mean free acidity in 5 cases when the hourly, two-hourly, and light diets are compared. In the first column is shown the maximum of free acid present when a fractional test-meal was done. The tables show that this figure bears no constant relationship to the mean free acidity during twenty-four hours and cannot be taken as an indication of the secretory response of the stomach to food over long periods.

TABLE I—COMPOSITION OF DIETS AND DOSES OF DRUGS

Hourly diet	5 oz. of milk, milk pudding, or vegetable purée—e.g., potato, artichoke. Each feed of milk or of milk pudding has 1 oz. of cream added.
Two-hourly diet	5 oz. of milk, milk pudding, or vegetable purée from 8 A.M. to 10 P.M., with three main meals consisting of oatflour porridge and 1 or 2 eggs at breakfast (8 A.M.); chicken, rabbit, fish, or tripe and milk pudding at luncheon (1 P.M.); and eggs or fish at supper (6 P.M.).
Light diet	Breakfast (8 A.M.): porridge, eggs or fish, milk or milky tea, and toast. Dinner (1 P.M.): cream soup, chicken or rabbit, fish or tripe, and milk pudding. Tea (4 P.M.): toast or biscuits, and milky tea. Supper (6 P.M.): eggs or fish, tea, and toast. Milk 5 oz. before going to sleep.
Drugs	Atropine sulphate gr. 1/200 before breakfast and luncheon and at night. Alkaline powder (heavy magnesium carbonate 1 part, calcium carbonate 1 part, and sodium bicarbonate 2 parts) 1 drachm four times a day after feeds. Olive oil ½ oz. thrice daily.

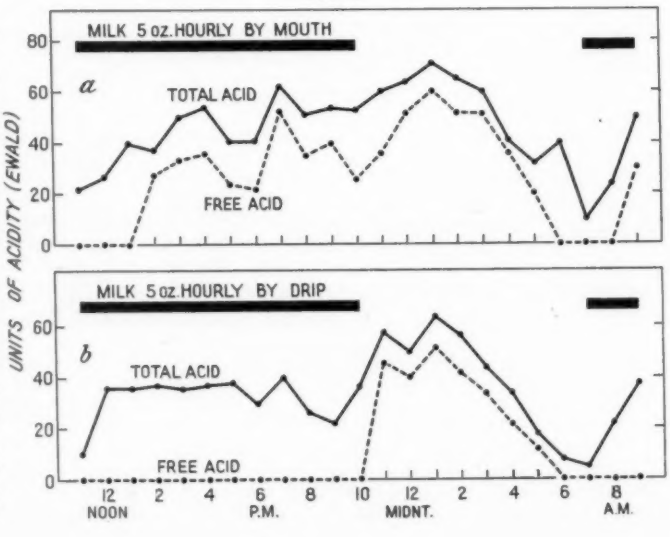
The two-hourly and light diets give very similar results, and in 4 out of the 5 cases these are considerably lower than the mean acid value on the hourly diet. Table III shows the results in a further 14 cases of peptic ulcer when the acidity on the hourly diet is compared with that on the two-hourly diet. The two-hourly diet in every case gives a lower figure, in some only lower by a few units, in others less than half.

It can be concluded from the above experiments that two-hourly and light diets are better than an hourly diet in neutralising the gastric secretion of hydrochloric acid.

EFFECT OF LARGE DOSES OF ATROPINE AND ANTACIDS

During the course of the previous experiments it became obvious that the standard amounts of atropine, olive oil, and alkaline powder used with the diets had little or no effect on the mean gastric

FIG. 2



acidity, and further tests were therefore carried out to estimate the results of much larger doses of atropine and of large doses of the new "neutral antacids" For this purpose atropine sulphate gr. 1/50 every four hours, or 1 drachm of magnesium trisilicate or aluminium-hydroxide gel every hour from 7 A.M. to 10 P.M., was given with the two-hourly diet shown in table I. The atropine was administered in 1 oz. of water before the feeds, and the antacids shortly after the feeds.

Table IV shows the mean free acidity of the 24-hour test-meals done in 5 patients on the two-hourly diet with and without atropine sulphate gr. 1/50 every four hours. It will be seen that atropine, given in toxic doses, does not produce any constant or pronounced effect on gastric secretion.

Table V shows the mean free acidity of the 24-hour samples obtained from 9 patients on the two-hourly diet with and without 1 drachm of either aluminium-hydroxide gel or magnesium trisilicate every hour from 7 A.M. to 10 P.M. It is seen that neither aluminium hydroxide nor magnesium trisilicate produced any constant or pronounced effect on the mean acidity of the gastric contents during twenty-four hours.

FIG. 3

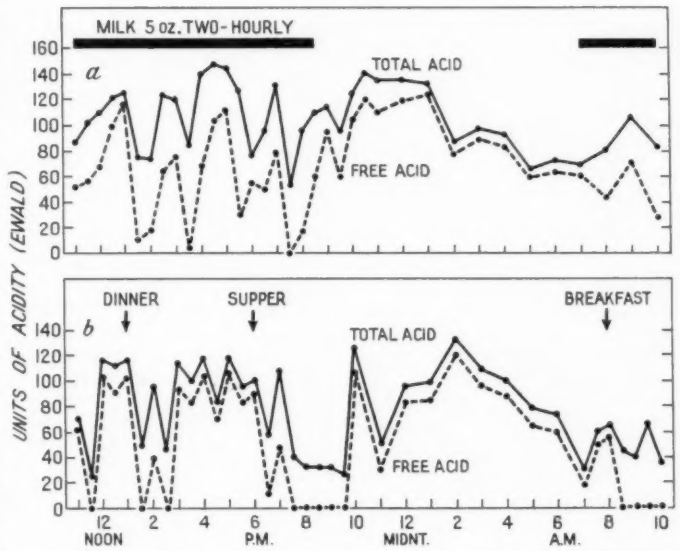


TABLE II—MEAN FREE ACIDITY OF GASTRIC SPECIMENS OVER 24-HOUR TEST PERIODS IN 5 CASES OF PEPTIC ULCER ON HOURLY, TWO-HOURLY, AND LIGHT DIETS

Diagnosis	Maximum free HCl F.T.M.	Mean free HCl		
		Hourly diet	Two-hourly diet	Light diet
D.U.	74	61	39	47
"	28	37	17	21
"	29	48	39	42
"	70	65	60	60
G.U.	28	54	46	42

F.T.M. = fractional test-meal;
D.U. = duodenal ulcer; G.U. = gastric ulcer.
Units = number of c.cm. of N/10 NaOH required to neutralise 100 c.cm. of gastric specimen.

DISCUSSION

Milk and the antacids tested, in the quantities usually given to these patients, neutralise more than 2000 c.cm. of a 0·3 per cent. solution of hydrochloric acid in vitro, this amount of acid being usually taken as the upper limit of normal gastric secretion in twenty-four hours. Two main factors may be responsible for the fact that these substances do not neutralise the free gastric acidity in vivo: (1) in patients with peptic ulcer and hyperacidity the time during which interaction can take place between milk, or any other antacid, and hydrochloric acid may be unduly shortened by a decreased emptying-time of the stomach; and (2) a much larger volume of gastric juice may be secreted.

TABLE III—MEAN FREE ACIDITY OF GASTRIC SPECIMENS OVER 24-HOUR TEST PERIODS IN 14 CASES OF PEPTIC ULCER ON HOURLY AND TWO-HOURLY DIETS

Diagnosis	Maximum free HCl F.T.M.	Mean free HCl	
		Hourly diet	Two-hourly diet
D.U.	60	52	50
"	?	50	42
"	100	74	49
"	60	55	46
"	74	61	39
"	28	37	17
"	88	68	37
"	29	48	39
"	40	56	53
"	25	74	62
"	100	61	60
"	70	65	60
G.U.	28	54	46
G.U. and D.U.	67	49	17

TABLE IV—MEAN FREE ACIDITY OF GASTRIC SPECIMENS OVER 24-HOUR TEST PERIODS IN 5 CASES OF PEPTIC ULCER ON TWO-HOURLY DIET WITH AND WITHOUT ATROPINE SULPHATE FOUR-HOURLY

Diagnosis	Maximum free HCl F.T.M.	Mean free HCl	
		Two-hourly diet	Two-hourly diet + atropine gr. 1/50 four-hourly
D.U.	?	42	41
"	100	49	43
"	100	60	43
"	70	60	62
D.U. and G.U.	67	17	24

Evidence that a decreased emptying-time plays an important part in preventing the diet and drugs from neutralising the acid has been obtained by comparing the mean gastric acidity over twenty-four hours, on a diet of 5 oz. of milk given hourly by mouth, with the mean acidity when the same amount of milk is administered by a continuous drip directly into the stomach. Fig. 2 shows the findings in such a case. With the continuous drip (*b*) complete neutralisation was obtained, and a considerable combined acidity was recorded, whereas, when the milk was given at the beginning of each hour (*a*), a higher free acidity and a lower combined acidity resulted. This

indicates that the greater part of 5 oz. of milk is discharged into the duodenum in less than an hour, leaving little in the stomach to combine with the acid secreted before the next feed is given. Table VI shows the figures abstracted from seven such experiments on 5 cases of peptic ulcer and 2 controls. In each case the continuous drip method gives a much better control of the acidity than feeds given at hourly intervals.

The finding of a lower mean acidity on the two-hourly and light diets than on the hourly feeds may be explained by the fact that the former contain more protein, and that three of the meals are of larger bulk. The better neutralising power of larger protein meals is shown in fig. 3. The patient, who had a duodenal ulcer, was first given two-hourly feeds of 10 oz. of milk (*a*), and the acidity was reduced for 30–60 min. after each feed before returning to its previous level. He was next given three full meals in the twenty-four hours (*b*), with intermediate hourly doses of 1 drachm of alkaline powder. After the main meals the acidity was controlled for 2–3½ hours,

TABLE V—MEAN FREE ACIDITY OF GASTRIC SPECIMENS OVER 24-HOUR TEST PERIODS IN 9 CASES OF PEPTIC ULCER WITH AND WITHOUT ANTACIDS

Diagnosis	Maximum free HCl F.T.M.	Mean free HCl		
		Two-hourly diet	Two-hourly diet +mag. trisil. 1 drachm hourly	Two-hourly diet +Al (OH)$_3$ 1 drachm hourly
D.U.	88	37	45	—
"	63	49	38	—
"	39	62	54	56
"	82	62	58	—
"	100	60	45	—
G.U.	42	28	34	40
"	36	36	22	18
D.U.	—	50	—	33
"	—	52	—	46

but between meals the alkali, acting alone, produced little neutralisation.

CONCLUSIONS

(1) Adequate control of the free acidity of the gastric contents in peptic ulcer associated with hyperchlorhydria cannot be obtained by hourly or two-hourly feeding, either with or without large doses of atropine or antacids.

(2) The fact that hourly feeds of milk do not produce neutralisation is in large part due to the rapidity with which the milk is emptied out of the stomach.

(3) Two-hourly feeds of a mechanically non-irritating type containing more protein are superior to hourly feeds of milk or milky foods in the control of gastric acidity. Accordingly, for this reason and for the obvious benefit for both patients and nursing staff, it is suggested that two-hourly feeds should replace hourly feeds in the treatment of peptic ulcer.

(4) Atropine should be used only when pain and symptoms suggesting pyloric spasm are present. Its routine administration in the absence of such symptoms is unnecessary, because of its failure to influence gastric secretion. When it is given, the small doses usually recommended should be replaced by larger doses, sufficient to produce pharmacological effects —e.g., gr. 1/50 followed by gr. 1/100 every four hours until the limit of tolerance is reached.

(5) The above findings, together with the well-recognised fact that the symptoms of ulcer may disappear quickly with or without dietary restrictions,

TABLE VI—MEAN FREE ACIDITY OF GASTRIC SPECIMENS OVER 24-HOUR TEST PERIODS ON MILK

Diagnosis	Maximum free HCl F.T.M.	Milk 5 oz. hourly 7 A.M.–10 P.M.			
		By mouth		Continuous intragastric drip	
		During admin. of milk (16 hr.)	During 24 hr.	During admin. of milk (16 hr.)	During 24 hr.
D.U.	40	19	26	0	8
"	78	43	54	20	18
"	74	60	55	20	48
"	75	52	40	10	18
G.U.	26	22	23	5	5
Control	?	24	27	8	9
"	26	12	10	6	4

suggest that the importance of free acid in the stomach in interfering with the healing of ulcers has been overemphasised. Palmer (1930) has shown that healing will take place in spite of experimental efforts to increase the acidity.

(6) Finally, it is concluded, from evidence which will be published later, that the attainment of physical and psychological rest is of more importance in obtaining healing of ulcers than any rigid dietary regimen or the use of alkalis and atropine.

I wish to express my indebtedness to Prof. L. S. P. Davidson, at whose suggestion the greater part of this work has been carried out, and to thank him for much helpful advice and criticism.

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PROGNOSIS IN RABIES

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THE worker in an antirabic institute frequently finds himself at a loss when anxious patients ask how soon they can forget the haunting dread of a fearful death from rabies. Some years ago I was asked this question, and found myself in a quandary. No information appeared to have been collected along these precise lines. Diagrams were therefore prepared to help in providing a solution. I used the statistics collected at the Shanghai antirabic institute.

The answer to the anxious patient's question is provided by the chart (upper section). The vast majority of deaths in treated cases occur before the sixty-fifth day after the bite and most of them before the fiftieth. It is interesting to note that in dogs the most likely time for rabies to develop is about the fortieth day after the bite.

A few deaths in untreated persons have also been reported to the department and these are recorded graphically in the chart (lower section). There are apparently two periods of greatest risk in untreated cases. There is a definite peak in the death-rate on the thirtieth day in both treated and untreated cases, but there is a second peak on the sixtieth day in the untreated cases. One cannot help wondering whether this second peak of deaths among the untreated persons represents those who would have been saved had they received treatment.

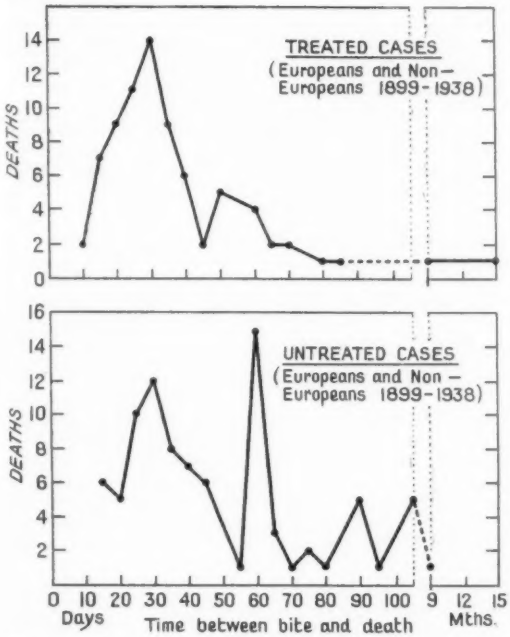


Chart showing the time at which death took place in fatal cases, treated and untreated.

A study of the chart shows that it is possible progressively to reassure one's patients as the time from the bite becomes greater, and after three months the chances of the disease developing are minute.

From 1899 to 1924 patients in this institute were treated by the dried-cord methods. From then on, the Semple vaccine was used. The cord treatment was given to 963 patients, but of these 163 were precautionary treatments only. Therefore only 800 patients were "true" risks. The Semple treatment was given to 5543 patients, of whom 2972 were "true" risks. The percentage mortality in successive groups of 800 patients is shown in the table; it also shows

TABLE SHOWING RESULTS OF DIFFERENT TREATMENTS

	Method of treatment	Mortality (%)
1st 800 patients.. ..	Cord	4·0
2nd ,, ,, ...	Semple	2·0
3rd ,, ,, ...		1·75
4th ,, ,, ...		1·25

a higher mortality than that claimed by many other institutes, but the Semple treatment compares favourably with dried-cord treatment. It was at one time claimed that the Shanghai rabies virus was more virulent than in other countries, but it is not really necessary to bring forward such a solution. I think the principal reason for the higher mortality in Shanghai is the time that is allowed to elapse before patients present themselves for treatment.

The variety of wounding has a considerable bearing on rabies prognosis. Of the severe head-and-neck wounds, 24·2 per cent. died under the dried-cord treatment and 18·8 per cent. under the Semple treatment. Of severe body wounds and slight head-and-neck wounds, 6·6 per cent. died under the dried-cord treatment and 3·9 per cent. under the Semple treatment. Of the slight wounds, 0·8 per cent. died under the dried-cord treatment and 0·9 per cent. under the Semple treatment.

The figures on which this study is based are admittedly small, but they are published to give a rough-and-ready prognostic guide to those giving antirabies treatment, and in the hope that those with larger series available will be prompted to provide more reliable data.

REVIEWS AND NOTICES OF BOOKS

Fifield's Infections of the Hand

(2nd ed.) By PATRICK CLARKSON, F.R.C.S., surgical tutor and demonstrator of anatomy and operative surgery, Guy's Hospital, London. London: H. K. Lewis and Co. 1939. Pp. 167. 9*s*.

FIFIELD'S book appeared in 1926 and was immediately popular, for it supplied a want that was then only too obvious—a lucid manual of the septic hand for students, house-surgeons and practitioners. That is not forgetting Kanavel's classic monograph, to which the author gives full credit. Now within the modest space of 167 pages, Mr. Clarkson presents in readable form all the essential points. The first chapter provides the basic anatomical knowledge without which no infection can be understood or treated. In this section brevity has occasionally obscured the meaning, and there are one or two slips in terminology, such as metacarpi for metacarpals and pisiformis for pisiform. These faults are not found in the later chapters, which deal in turn with the anatomical varieties of infection, their treatment in detail, and their complications; modern methods, such as the use of sulphonamides and short-wave therapy, receive proper notice. The final chapters on general treatment, and on insurance aspects and prognosis are particularly valuable. The book is freely illustrated with coloured plates and line drawings. The price is very reasonable.

Chirurgie de la main

(3rd ed.) By MARC ISELIN, chirurgien de l'hôpital Américain, Paris. Paris: Masson et Cie. Pp. 320. Frs.65.

Dr. Iselin came across a copy of the second edition of his work in a library and discovered that the sections dealing with wounds and infections of the hand had been freely read, while the section dealing with reparative surgery had hardly been fingered. For this reason he presents the third edition in two parts: the first dealing with wounds, infections and closed injuries; the second, to appear later, dealing with reparative and plastic surgery of the hand. In this first part he has added chapters on fractures of the hand and fingers (modelled on the work of Böhler), a chapter on evaluation of incapacity, a chapter on trophic and painful lesions of the hand (after Leriche and Fontaine), and he has remodelled the chapters on open fractures and the prevention of tetanus. The book opens with a homily on wounds, stressing once again the all-important fact that most hand infections can be prevented by careful and proper attention to cleansing and débridement of all wounds. It deals in turn with wounds of the fingers, of the thumb, of the palm and of the dorsum. It passes next to a detailed study of infections, both localised and diffuse, and the proper treatment for each. The chapter on tenosynovitis is especially to be commended, for it

describes and criticises the various incisions that have been practised by different surgeons, and points out the value of short incisions placed opposite the more bulbous and thinner parts of the sheaths. Infections of palmar spaces receive adequate anatomical and clinical study. The addition of a section dealing with fractures and dislocations is appropriate, for these injuries are often regarded as unimportant.

The whole book can be strongly commended, as it is dedicated, to students, practitioners and surgeons.

Yearbook of Neurology, Psychiatry and Endocrinology

Edited by HANS H. REESE, M.D., professor of neurology and psychiatry, university of Wisconsin medical school; HARRY A. PASKIND, M.D., Ph.D., associate professor of nervous and mental diseases, Northwestern University school of medicine; and E. L. SEVRINGHAUS, M.D., professor of medicine, University of Wisconsin medical school. Chicago: The Year Book Publishers; London: H. K. Lewis and Co. 1939. Pp. 776. 12*s.* 6*d.*

THE compilers of a work of this kind must be at once anthologists, abstracters and critics, and the editors have here faced their task with commendable discretion and catholicity. The neurological section has been skilfully chosen. At times Professor Reese refrains from adding comment where it is needed—e.g., after his lengthy extract of a recent paper by Panegrossi on the Bulgarian treatment of epidemic encephalitis or that of E. L. Stern about subarachnoid injection of vitamin B_1; but his abstracts are informative and his notes on them terse and pointed. Surgical procedures are duly included, as in the chapter on the automatic nervous system, and the section is generously illustrated. The psychiatric section is excessively diffident. It is less than half the length of either of the others yet nearly as much space is given to the insulin and cardiazol treatment of schizophrenia as to all the rest of psychiatry. Only four articles on the psychoneuroses are abstracted. Many readers will sympathise with the editor in his manifest distaste for verbose or vague papers, but in the present state of the subject his selection is so personal as to give rather an unbalanced picture. It would be less so if he included papers with a psychological bias, adding editorial comment in a footnote. The proportion of papers from the United States, Germany and Great Britain is approximately 4 : 2 : 1.

Practical Bandaging

(5th ed.) By ELDRIDGE L. ELIASON, M.D., F.A.C.S., professor of surgery, University of Pennsylvania. London: J. B. Lippincott Company. Pp. 128. 7*s.* 6*d.*

THIS little book provides much practical information which would be of value to nurses and orderlies as well as to the many part-trained individuals who may be called upon to help in the treatment of injuries. It hardly gives enough detail for the house-surgeon about the less common forms of technique, though it refers to many orthopædic expedients. The illustrations, both in line and half-tone, are numerous and very clear, and all the classical forms of bandaging are described; hence the book would be helpful for a first-aid examination, while its practical value is enhanced by the author's comments on points and modifications evolved during use. Indications for the various types of bandage have been deliberately omitted. There is a good section on adhesive-plaster technique, which is even more widely used in the U.S.A. than here. The section on plaster-of-paris is a little disappointing; there is a lack of guidance about application, the advantage of stockingette over flannel for lining the splint is not referred to, and the plaster-cutters illustrated are not nearly so efficient as Stille's, nor is the useful key-hole saw mentioned. The photograph of plaster splints show crude types in poor position—e.g., the walking-pattern is applied at a tilt that would make walking difficult. Despite these minor defects the book can be recommended for its purpose as a useful addition to the nurse's library.

The Living Body

A Text in Human Physiology. By CHARLES HERBERT BEST, M.D., D.Sc. Lond., F.R.C.P. Canada, F.R.S., professor and head of department of physiology in the University of Toronto; and NORMAN BURKE TAYLOR, M.D., F.R.C.S.E., F.R.C.P. Canada, professor of physiology in the university. London: Chapman and Hall. 1939. Pp. 563. 18*s.*

THIS concise work, written primarily for students not taking a medical course, realises the expectations raised by the larger book by Best and Taylor on the physiological basis of medical practices. The text is clear and dogmatic, and covers the field almost completely, for brevity has been attained at the expense of depth rather than extent. Medical students should use the book only, as is suggested in the preface, to gain a bird's-eye view of the subject, and should not be deceived by the excellent diagrams, many of which are in colour, or by the correctness and up-to-dateness of the text, into thinking that this is all they need. That part of the background of physiology which is the most puzzling for the non-medical student, and which consists chiefly of the anatomy and histology of the organs, is adequately treated and skilfully illustrated, and the book provides an authoritative text for a class of student too often overlooked.

Hypertension and Nephritis

(4th ed.) By ARTHUR M. FISHBERG, M.D., associate in medicine, Mount Sinai Hospital, New York City. London: Baillière, Tindall and Cox. 1939. Pp. 779. 37*s.* 6*d.*

THE appearance of a new Fishberg is a notable event, for it has become the standard English textbook on nephritis and hypertension. The clarity of writing, the lucid reasoning and the scholarly survey of the literature are repeated once more, and one's only word of regret is that the author has found himself obliged to increase its size by a hundred pages so that it is now a really big book. The most notable additions are a study of the experimental production of hypertension, and a section dealing with the mercurial diuretics. Omissions now filled are a description of the skeletal changes in chronic renal failure and the paroxysmal hypertension associated with certain adrenal tumours. Dr. Fishberg is to be congratulated on the practical character of his book, which, if its appeal be first and foremost to the more specialised physician, remains a volume which can be read with interest and profit both by the student and the family doctor.

The Diabetic's Vade Mecum

By O. LEYTON, M.D. Camb., F.R.C.P. London: John Bale, Sons and Curnow. 1939. Pp. 41. 2*s.* 6*d.*

THIS small book by the late Dr. Otto Leyton contains all the essential things a diabetic should know in a very few pages. It is set out in the clear style characteristic of the writer.

THE LANCET

LONDON : SATURDAY, OCTOBER 21, 1939

THE SEARCH FOR TRUTH

THE growth of science has influenced the course of men's lives in two directions. It has given man greater power over the resources of nature and thus has raised his standard of material living; this is a direct result of discovery and of the application of knowledge. Its indirect result, a more general use of rational thinking, has been no less important though less spectacular, perhaps because its influence is slower. The great discoveries of NEWTON, though immediately only concerned with the laws of motion and physical force, by their simplicity and range united in men's thought the structure of the universe; what was true of a candle's beams must also be true of light from the sun and the most distant stars. There are no islands of autonomous local truth in a dividing sea of chaos, but one rule of law stretching to the boundary of human discernment and beyond it. The indirect effect of the realisation of the unitary character of the universe was a confidence in reason in the face of the ever-prevalent human tendency to superstition, that expression of distorted emotional thinking. The spanning of the stretches of interstellar space by man's measuring devices strengthened his belief in the active power of his mind so that it did not quail before the apparently more elusive mysteries of his mental life. The realm of magic and superstition was attacked with a self-confidence previously lacking, and, in the age of reason, blind wonder at the terrifying incomprehensible gave place to a determination to clarify and map out, if only by slow stages, this last remaining *terra incognita*—man's too emotional ways of thought.

In the crisis now affecting us in the infancy of our civilisation we may perhaps learn something from the early development of science. We in England, and our colleagues in Germany, are faced with an enigma which each in his own way tends to answer with wishful thinking—what is going on in the mind in enemy countries. Between them and us stretches that most terrible of all barriers, a war frontier. The first assumption we have to make, if that gap is to be bridged, is that the laws of mental life in that unknown land are, like the physical laws, exactly the same as ours. It is a difficult assumption because as a result of war we are led all too readily to the illusion that the enemy on the outbreak of hostilities loses something of his humanity whereas we do not. The irrational notions we cherish during war, no doubt stimulated by the strain, are comparable to the emotional beliefs which the age of reason so largely dispelled from everyday life. It would now seem to us odd if someone said that an individual was possessed of a devil, because we cannot believe that an individual is subject to other influences than those of heredity and environment—and this holds for his highest ideals as well as his most degrading ideas. We neither exorcise the devil nor subject the possessed to torture, but study his mind and the forces which moulded it. This we can do because we believe in the constancy of mental reaction as we believe in the constancy of physical reaction. With nations it calls for an effort to retain the same objectivity which we now ordinarily apply to single human beings.

With the widening of the range of subjects to which we apply reason there is of course a narrowing of the fields in which our phantasies have free play, and one of these is nationality. Perhaps the task of this generation, a task thrust upon us all too quickly and forcibly by the rapidity and power of mechanical invention, is to clarify the emotional and political issues—they are surely inseparable—of our communal life as this affects us both as individuals and as nations. Political thought in Europe today revolves round two major issues, nationality and the regulation of economic life. No nation now facing a crisis can consider these matters solved, nor can any of them impose their own solution upon another group with any prospect of permanence and success. A realisation of this should strengthen us to resist the egoism and ambition of tyrants, as it should also humble us before the no less gigantic task of fashioning the terms of armistice and peace.

The boundaries of our social and economic life are dissolving away as a result of man's increasing control over the forces of nature; the facility of contact in peace and in war will be a sorry gain if the minds of the nations are not prepared to consider the new responsibilities which improvement in communications inevitably brings in its train. Sooner or later, if the horror of war is not to devastate the whole of our civilisation, the nations will have to recognise that they cannot live in cultural islands of their own devising, separated by troubled seas of ignorance and suspicion, but will have to plan on a new basis for an era of neighbourliness. The recognition of the universality of natural law has two phases, that of matter and that of mind. An exclusive application to the first has imperilled civilisation; only application to the second will save it. We should no longer trust to the often blind and too often destructive guidance of our feelings, especially when we have power in our hands. Man's spirit has risen to great heights of constructiveness and some of his works bear the stamp of eternity and truth. Our precious heritage of culture calls not only for valour in arms for its protection but courage to refashion it as our increasing knowledge of our human weakness discloses the causes of the defects in its structure. The search for truth gives man fortitude and the reward of those who seek it is peace.

THE CONTROL OF TETANUS

THE likelihood of our land and air forces soon being engaged in large-scale operations brings into prominence again those bacterial infections which are more common on the battlefield than in civil life. Among them is tetanus, though why this infection should follow war-wounds so much more often than it does road-accidents is difficult to explain. Contributory factors are a badly lacerated wound with hæmorrhage and necrosis of tissue, contamination of the wound with a richly manured soil containing ionisable calcium salts as well as tetanus spores and the toxins of other anaerobes; acting singly or together these lower the oxidation-reduction potential of the tissues and so allow free germination of the tetanus spores. There is, besides, the risk of infection from imperfectly sterilised dressings.

In the last war prophylactic injection of antitetanic serum was introduced in October, 1914, and the incidence of tetanus dropped from 9 per 1000 wounded to less than 1 in 1915; it rose again in 1916, probably because of the more accurate diagnosis of local tetanus, and fell again to less than 1 per 1000 in 1917 and 1918. The second fall coincided with a more general adoption of the early excision of wounds and the introduction of repeat-injections of A.T.S. Not only was the incidence greatly reduced, but among cases developing tetanus the incubation period was lengthened from an average of 11·8 days in 1914 to 48 days in 1917 and the severity of infection diminished, the fatality-rate being 22·6 per cent. in the inoculated and 53·3 per cent. in the uninoculated. The proportion of local tetanus also rose from 1·1 per cent. in 1914 to 23·4 per cent. in 1917. These figures, given by BRUCE,[1] show that while prophylactic A.T.S. has accomplished a lot, it does not, as used in the field, give absolute protection against tetanus, and there are the additional drawbacks of serum-sickness and serum-shock from repeated injections of a foreign protein. Recent years have seen the introduction of active immunisation, chiefly by the use of formol-toxoid ("anatoxin" of the French writers). This method of protection has long been used for the prevention of equine tetanus and for several years a combined active and passive immunisation has been employed for wounded soldiers in the French army. Over a year ago active immunisation was offered to regular troops of the British army [2] and since then a similar procedure has been adopted by the R.A.F. It is to be hoped that such immunisation, which can be combined with inoculation of T.A.B. vaccine, will be made compulsory for all troops on foreign service. The course consists of two 1 c.cm. doses of formol-toxoid at an interval of six weeks, and is calculated to raise the tetanus antitoxin content of the recipient's blood to 0·1–1·0 unit per c.cm., a level which is more than adequate to prevent an attack of tetanus. After a time this level drops, sometimes rather quickly, and it may be advisable to give a further injection of toxoid after a 2–5 years' interval. SNEATH and KERSLAKE,[3] for example, found that an injection given in the second year after immunisation raised the antitoxin content of the blood 10 to 500 times that of the residual level. But it is expected that any incipient tetanus infection would itself act as the secondary stimulus, although the French advocate an immediate injection of toxoid for the freshly wounded and already vaccinated soldier.[4] If the patient has not been vaccinated, he should receive first 1 c.cm. of tetanus toxoid followed by 3000 units of A.T.S. and then at 15 day intervals two further injections of toxoid. RAMON even recommends active immunisation at 5–6 day intervals for the declared case of tetanus, besides a single massive dose of 150,000 units of antitoxin, now obtainable in much more concentrated form. The serum should be given intracisternally, intravenously and intramuscularly, as well as subcutaneously round the wound.

It is perhaps a sidelight on the present status of medical science in Germany that at two recent discussions [5] on the prophylaxis of tetanus by bacteriologists and surgeons only one speaker dealt with active immunisation and then without giving any evidence of its clinical use. Early and thorough excision of the wound was generally recommended, with weekly injections of prophylactic A.T.S. in severe cases. Using these methods SCHNEIDER [6] observed only 4 cases of tetanus among 40,000 injured people in Freiburg where tetanus is not uncommon. No doubt the proper surgical treatment of war-wounds will still be necessary in the prevention of tetanus, but as far as specific prophylaxis is concerned the immediate future promises another instance of "off with the old and on with the new."

1. Bruce, D., *J. Hyg., Camb.* 1920, **19**, 1.
2. Boyd, J. S. K., *J. R. Army med. Cps*, 1938, **70**, 308.

ECONOMICS OF A DECLINING POPULATION

AN eventual decline in our population seems certain unless it is stemmed by an unlikely increase in fertility or by immigration on an unprecedented scale. When the fall will begin is less clear, since prediction depends on forecasts of the fertility, age-specific mortality and immigration rates, which have departed from expectation in recent years. The work of GLASS and BLACKER, ENID CHARLES and GRACE LEYBOURNE has shown how this trend will be associated with radical changes in the age-distribution of the population. Some of the implications are fairly obvious and point the way for planning future social services. If any area now has sufficient school accommodation it will soon have too much, and the same applies to playing grounds and hospitals for children, school clinics and maternity and child-welfare centres. But measures for preserving the lives and health of children and mothers will be all the more necessary, and they

3. Sneath, P. A. T., and Kerslake, E. J., *Brit. med. J.* 1935, **2**, 290.
4. Ramon, G., *Pr. méd.* 1939, **47**, 877 and 981.
5. *Klin. Wschr.* June 16, 1939.
6. Schneider, H., *Dtsch. med. Wsch.* Aug. 11, 1939, p. 1261.

will have to be extended in quality if not in quantity. On the other hand, the actual, and not merely relative, rise in the number of people over forty-five, which will continue for many years, will present some difficult health problems, complicated by the probability that this group will also eventually diminish. For some years the demand must increase for curative or palliative provision for the aged, who have hitherto received little organised and enlightened consideration. A relatively stationary working population will then be faced with new costs, and few tangible economies to offset them. Will this mean a progressively poorer community, paying for the services necessary to stave off a still more evil day only by denying itself other amenities of life? Mr. W. B. REDDAWAY [1] gives a provisional but not a definitive answer.

Economic prosperity depends on innumerable material and some psychological variables. In Mr. REDDAWAY'S view the major peace-time barrier to economic advancement is the occurrence of slumps, or, what may be conducive to them, the fear of slumps among those controlling capital. If we can find means of anticipating and forestalling catastrophic drops in the trade cycle, the amount of capital, the income per head, and therefore the standard of living, should rise. Population changes may make it more difficult to keep down unemployment generally, and more especially the particular unemployment arising from technical revolutions or fickle changes in fashion; for an older population is less adaptable. An immediate raising of fertility, accompanied by the present increase in old people, would merely add to the numbers of dependants, and can therefore hardly be advocated on economic grounds alone.

Mr. REDDAWAY suggests that planning can obviate economic crises and that a planned economy is urgently needed, irrespective of the new factor introduced by a falling population. Unemployment is a man-made problem which man ought to be able to solve. But there are two provisos. Mr. REDDAWAY ignores the more gloomy prognostications which foretell a rapid fall in numbers towards the end of the century until we are left with some five millions in 2035. The implications of such a decline cannot be foreseen. The other is of fundamental importance and affects the whole argument. Writing before September 1939 he says, "Avoid wars, for these are the creators of all major debts. Indeed, a major war would simply make our whole discussion of public finance (if not the whole of this book) virtually irrelevant." Even more than when these words were written, a falling population appears to be a minor factor in the economic problems with which we shall be faced. The war may intensify the need for efficient public-health and medical services and at the same time destroy many of those who would have contributed to their maintenance. It will probably accelerate the decline in fertility. In any case the burden of debt is likely to be so heavy that the future of the social services may be jeopardised unless some new solution, such as a compulsory and automatic depreciation of all capital, can be found.

ANNOTATIONS

UREA TREATMENT OF WOUNDS

THE time has come for a change of ideas about urea: it must no longer be regarded merely as a rather undesirable end-product of metabolism, but also as a therapeutic agent of some value. Urine has long been applied to wounds by poor people in backward countries, but the possible use of urea in scientific medicine was not considered until Spiro [2] showed, about forty years ago, that it has a powerful solvent action on protein. In 1915 Symmers [3] found that urea is bactericidal and Kirk [3] used it with success in the treatment of wounds, both to prevent and to cure local infection. For some time after this the method seems to have fallen into disuse, but it has lately been revived in America. The latest report is by Holder and MacKay [4] who, after more than two years' experience, are convinced of the value of urea in the treatment of infected wounds. They apply it in one of three forms: as a saturated aqueous solution, as a paste (containing 50 per cent. urea and 2·5 per cent. karaya gum), or as crystals. Generally speaking, the crystals are to be preferred, but their disadvantage is that they "cake" in the wound and are difficult to keep in close contact with the tissues. The solution is used for irrigating cavities and sinuses. Sometimes the application of urea to a wound causes pain, but this can be prevented by adding Eucupin in a concentration of 0·5 per cent. To illustrate the success of their method Holder and MacKay describe five representative cases comprising an empyema, a necrotic pilonidal cyst, an infected burn, a severely crushed and lacerated foot and a similarly wounded hand. In all of these the sloughs rapidly disappeared and healthy granulation tissue developed. Equally satisfactory results have been reported by Muldavin and Holtzmann [5] who used the method in 170 cases in the casualty department of the Royal Free Hospital. The advantages of the urea treatment may be summarised as follows: it is effective; it is cheap; it rapidly abolishes odour; it does not irritate the wound or cause dermatitis; it is not toxic. Holder and MacKay's paper raises a question of terminology that deserves comment. It appears that a reviewer of one of their reports suggested that as the word urea is associated in many minds with urine its synonym carbamide should be used instead. An additional reason given for the change is that urea is now prepared synthetically. Yet it seems a pity that Holder and MacKay have adopted the suggestion. Even if it is agreed that the association of the word urea with urine is undesirable (and many would not agree) it does not justify the addition to medical terminology of yet another unfamiliar word. Moreover, urea has been synthesised for more than a century.

Another successful if exotic treatment of infected wounds is by means of maggots, and it is interesting

1. The Economics of a Declining Population. By W. B. Reddaway, M.A. Camb. London: George Allen and Unwin Ltd. 1939. Pp. 270. 8*s*. 6*d*.
2. Spiro, K., *Hoppe-Seyl. Z.* 1900, **30**, 182.
3. Symmers, W. St. C., and Kirk, T. S., *Lancet*, 1915, **2**, 1237.
4. Holder, H. G., and MacKay, E. M., *Ann. Surg.* July, 1939, p. 94.
5. Muldavin, L. F., and Holtzmann, J. M., *Lancet*, 1938, **1**, 549.

that there may be a close relation between this method and urea therapy. The active principle by which the maggots work is supposed to be allantoin, and allantoin has been found to produce urea when hydrolysed. May it be that these two very different methods of treating wounds—the one complicated and expensive, the other simple and cheap—are at root the same?

BABIES CHOOSE THEIR OWN MENUS

CHILDREN evacuated from towns to country districts often dislike the wholesome food put before them, preferring the tasty but less satisfactory "bits and pieces" to which they have been accustomed at home. This question of children's food-fads has been the subject of further experiment in Canada, described by Clare M. Davis [1] before the section of pædiatrics of the Canadian Medical Association this summer. The choice here, however, was not between wholesome and not-so-wholesome food but between different items of wholesome food, and the report is concentrated on the effects on the children rather than on what food they preferred. One outstanding fact about their preferences is that after a period of trial and error they all rejected cereals as a predominant element in their nutrition.

Babies aged 6–11 months, who had never tasted the ordinary foods of adult life, were allowed to select their own diet. The nurse sat quietly, spoon in hand, by the infant and waited for him to reach for or point to an item of food. A spoonful of it was then offered without comment. The infant was allowed anything he indicated in any amount. He might eat with his fingers or by any other method without restriction. When he stopped eating, usually after 20–25 min., the tray was removed. Thirteen babies were allowed to choose their food in this way for periods ranging between a year and 4½ years, and the remaining two babies for not less than 6 months. The whole group was afterwards followed up for 6 years. Careful examination, including blood-counts and radiography of the bones, has shown an optimal standard of nutrition. No cod-liver oil or any dietary adjuvant was offered to the infants, all of whom had healthy appetites throughout, and there was no constipation and no serious illness during the 6 years. Vomiting and diarrhœa were unknown, except in the presence of parenteral infections, and these were mild. Lest Dr. Davis might be thought too enthusiastic about her experimental troupe, she quotes Dr. Joseph Brennemann's opinion of them as "the finest group of specimens from the physical and behaviour standpoint that I have ever seen in children of that age." The average daily intake of calories per kg. of body-weight and the distribution of calories among the chief constituents of the diet were in accord with accepted views.

The diets chosen were therefore on orthodox lines, although the children did not show any orthodoxy and their daily menu was completely at variance with pædiatric practice. Every diet differed from every other diet, and not one diet conformed to the predominantly cereal-and-milk diet, with small additions of fruit, egg, and meat, that is considered suitable at the weaning period. Moreover, tastes varied from day to day, and combinations of food were chosen which are described as a "dietician's nightmare." For example, one infant chose a breakfast of a pint of orange-juice and liver. He ended the day with a supper of several eggs, bananas, and milk. The infants chose their food by a process of trial and error. There was no evidence to suggest that instinct directed the choice. Random shots often indicated a spoon, dishes, the edge of the tray, or the paper on it as the desired food. Any extension of the method is open to the objection that errors may have a disastrous result, as when a child applies the experimental method to poisonous but attractive berries. This risk was excluded by the nature of the menu, which was confined to natural, unprocessed, and unpurified foods, without "made dishes"—the sort of diet which primitive peoples have evolved for themselves with satisfactory results. To call the experiment one on self-selection of foods by young children is misleading, for the infants were restricted to a choice made from thirty-four carefully selected items, as can be seen from the following list:

Water	Peas	Beef
Sweet milk	Turnips	Lamb
Sour (lactic) milk	Cauliflower	Bone-marrow
Sea salt (Seisal)	Cabbage	Bone jelly
Apples	Spinach	Chicken
Bananas	Potatoes	Sweetbreads
Orange-juice	Lettuce	Brains
Fresh pineapple	Oatmeal	Liver
Peaches	Wheat	Kidneys
Tomatoes	Corn meal	Fish (haddock)
Beets	Barley	
Carrots	Ry-Krisp	

The value of this method is summed up by Dr. Davis thus: "It eliminated anorexia and the eating problems that are the plague of feeding by the dosage method."

SURGERY IN ULCERATIVE COLITIS

ULCERATIVE colitis is characterised by its tendency to relapse and consequent indefinite prognosis. In chronic cases the early stages of ulceration of the mucous membrane of the colon are followed progressively by partial healing and contraction, with shortening of the bowel, narrowing of the lumen, mucosal destruction and pseudopolypoid degeneration. Unfortunately there is no specific remedy, and intestinal antiseptics are unavailing. Medical treatment consists of high-calorie, high-vitamin, low-residue diets, intestinal irrigations and in anæmic states blood-transfusions and iron. Recently, the factors of nervous strain and anxiety in initiating and perpetuating the complaint have been brought prominently before the profession, and psychological treatment has been advocated. In his opening address before the section of surgery at the 90th annual meeting of the American Medical Association, Dr. Henry W. Cave [1] points out that many of these measures are followed by temporary improvement; on the other hand relapse is common and in many cases the disease continues progressively. Surgical measures must therefore be considered and should not be left till too late. Dr. Cave's clinical material consists of 158 cases of ulcerative colitis treated at the Roosevelt Hospital, New York; 27 of them have been subjected to surgical intervention. These cases had failed to respond to conservative treatment and could be described as chronic intractable ulcerative colitis. Dr. Cave is sceptical of the value of appendicostomy, cæcostomy and colostomy as curative measures. The purpose of these openings into the bowel is to irrigate the colon in the hope that some antiseptic solution would destroy invading organisms and so effect a cure. In view of the actual pathological condition that exists, these three procedures are regarded as theoretically unsound and ineffectual in practice. Complete removal of the diseased bowel is essential to effect cure. All appropriate medical

1. *Canad. med. Ass. J.* September, 1939, p. 257.

1. *J. Amer. med. Assoc.* Aug. 12, 1939, p. 549.

measures are used in the preoperative preparation and the removal is accomplished in two, three or even four stages; the complete removal of the colon and rectum requires three or four operations, ileostomy, subtotal colectomy and proctectomy. After subtotal colectomy the majority of the patients improved to such an extent that doubt arose whether and when the rectum should be removed. When bloodstained mucus continues to be passed or there is inflammatory involvement in the perirectal space, with or without fistula, it is preferable to perform proctectomy.

Of the 158 patients treated, with a gross mortality of 7 per cent., six patients died while under medical supervision, a mortality of 3·7 per cent. Of the 27 patients operated upon, five died, giving an operative mortality of 18·5 per cent. A control series taken from other hospitals showed a mortality amongst the medically treated of 10·1 per cent., and an operative mortality of 30·8 per cent. It may be noted that the operation cases were those, often desperately ill, whose condition could not be controlled by medical management. Surgical intervention is called for in perforations, repeated hæmorrhages, strictures and for diffuse polyposis. If the colon and rectum are involved only on the left side, transverse colostomy (in the healthy part of the bowel), with removal of the remainder of the colon and the rectum, is justified; if the whole colon is diseased, ileosigmoidostomy followed by subtotal colectomy is needed, the rectum being removed later if involved. Dr. Cave concludes that operation offers more than a continuation of medical treatment, in spite of a mortality of about 20 per cent., a figure already lower than earlier published results, which placed the operative mortality at 50 per cent. In these septic and often semimoribund patients much may be done by teamwork and judgment limiting each operative procedure to an amount which the patient can bear.

GLUCOSE AND INSULIN IN ACUTE ALCOHOLISM

ALCOHOL seems to be got rid of from the body by a combination of excretion and oxidisation, but mostly by the latter. The alcohol content of the blood can be reduced by excessive ventilation of the lungs and by the ingestion of food. Many authors have suggested that there is a relation between the oxidisation of alcohol and that of glucose, and Goldfarb, Bowman and Parker [1] have now published some valuable data on the change in blood-alcohol which results from increasing the amount of glucose oxidised in the body. Their clinical material consisted of a number of intoxicated patients with a definite smell of alcohol in their breath. One group were given 15 units of insulin subcutaneously, a second 50 c.cm. of glucose intravenously, a third both of these remedies, and a fourth were held as controls. The blood samples were analysed by Abel's macro method. In the group given insulin only the alcohol did not disappear more quickly from the blood than in the controls. When moderately intoxicated patients were treated with glucose it made little difference, but in some severely intoxicated ones the average reduction was significantly greater than that of the controls. Treatment with glucose and insulin brought about a greater fall in blood-alcohol in patients suffering from both degrees of intoxication. The clinical effect on the patients was similar. The patients who received insulin alone all showed slight sweating and a fall in temperature. Those who were mentally clear often complained of feeling hungry after two or three hours. No significant changes were noted in the patients who had glucose alone, but those who were treated with glucose and insulin recovered consciousness in one-and-a-half or two hours. Most of them could give a rational history at the end of two hours, and some showed adequate motor coördination in four or five hours. The authors think it likely that the reason why the glucose alone did not usually accelerate the oxidation of alcohol was that the patients were in various stages of under-nutrition and could not oxidise the glucose. The injection of insulin, by insuring that the glucose was oxidised, accelerated the oxidisation of the alcohol. The reduction ranged from 75 to 275 mg. per 100 c.cm. in two hours, and they suggest that glucose and insulin may be an effective therapy for acute intoxication. It has the advantage over carbon dioxide and oxygen in needing no special apparatus and taking up only a few minutes of the physician's time.

1. Goldfarb, W., Bowman, K. M., and Parker, S., *J. Clin. Invest.* September, 1939, p. 581.

CLAUDE BERNARD

Professor Carrel in his foreword to Dr. Olmsted's life of Claude Bernard[1] hails him as the father of modern medicine. In truth no one man can with justice deserve such an exclusive title. No man's work is sufficiently independent of that of his immediate forerunners, or indeed of his contemporaries, for his discoveries to be separated and set apart on a pedestal; they are rather the milestones which mark a definite point from which further progress can be measured. Professor Carrel claims that Bernard was the first to introduce a strictly scientific method into the study of medicine, but a similar claim could be supported for such men as Bacon, William Harvey, or that great teacher, Boerhaave, who, as has lately been shown, demanded a full scientific training in chemistry, botany and mathematics as a preliminary education for the future physician. Claude Bernard was indeed, to vary the metaphor, a star of the first magnitude, but there are other stars no less brilliant in the long history of the development of medical science.

Bernard's life and work are sufficiently distinguished to need no comparisons; he of right takes his place with his peers. The son of a Beaujolais vinegrower, with what would now be considered and was then thought a poor education, and without any backing of wealth or patronage, he had yet by the age of 28 won for himself the position of assistant to Magendie, then the professor of medicine at the Collège de France. At that time Magendie was almost alone in his devotion to the advance of medical knowledge by means of experiment, and Bernard could have found no better or more sympathetic master. For fourteen years the two men worked together and Bernard's growing reputation was fostered by the older man who rejoiced when dying to know that his friend and pupil was marked out to succeed him. "My chair will go to you" he is reported as saying. "With you I know it won't fall to a nincompoop." The next twelve years of Bernard's life, from the age of 42 to 52, were the most productive period of his genius. They were marked by the outstanding discoveries with which his name will always be associated: the digestive function of the pancreas, the glycogenic function of the liver, the vasomotor system and the action of various poisons, especially of curare. At the age of 54 he was the outstanding scientific figure of France, towering, says Dr. Olmsted, above his friend and contemporary Pasteur. Then his health began to fail and multifarious activi-

1. Claude Bernard, Physiologist. By J. M. D. Olmsted, M.A. Oxfd, Ph.D. Harvard, professor of physiology, University of California. London: Cassell and Co. 1939. Pp. 318. 15*s*.

ties interfered with his productiveness. At 65 he died and was honoured by a public funeral, the first ever granted to a man of science.

Dr. Olmsted has written a detailed account of Bernard's life and has added a careful examination of all Bernard's work, pointing out its originality, its errors, its splendid successes and its chief title to fame—the almost religious adherence to the true spirit of scientific research. The volume is illustrated with some interesting photographs and a coloured reproduction from Bernard's work on the pancreas. It should help to make Bernard's achievements better known to a generation which has perhaps estimated him at less than his true worth.

LIGHT ON THE PROGRESSIVE HYPERPLASIAS

IN announcing their ability to produce uterine and extra-uterine fibroids in guineapigs by injection of an œstrogen, Lipschütz and Vargas[1] questioned the precise nature of the tumours they had created. Growth of plain muscle and fibrous tissue was induced by the hormone and continued only so long as the injections were given. When administration ceased not only was growth arrested but cell proliferation regressed. When simultaneously with the œstrin compound an antagonist—progesterone—was given tumours failed to develop.[2] If, as recorded in our present issue, testosterone was injected with the œstradiol, a feeble tumorigenic response followed, and hyperplasia of both uterine muscle and mucosa was also prevented in adult castrated female guineapigs. It is thus evident that induction, growth and regression of these fibroids can be controlled at will. As we have already pointed out,[3] several queries arise out of these new facts. Is this muscle-fibre proliferation of the same nature as true innocent neoplasia, and are human fibromyomata also caused by an endocrine imbalance? The morphological data so far available are insufficient to form a basis for comparison between the structure of these experimental tumours and human uterine fibroids. Are the former tissue tumours with organised stroma or are they merely cell proliferations? A common origin may be suspected on the ground that fibroids appear in women during the years when follicular ovarian function is active; in such patients there may well be an over-secretion of œstrin or absence of antagonising hormone, although we have so far only indirect evidence of this. Until the final answer to these two questions is known it is impossible to settle the question whether human uterine fibroids can be regarded as true autonomous new growths.

Meanwhile the story of these curious guineapig tumours leads one to speculate on the nature of that other large group of progressive cell proliferations—the reticuloses. Among these Hodgkin's disease is the commonest and best-known example, but a great variety are recognised. This group, though characterised by apparent autonomous growth, is distinguished from true neoplasia by the way the disease spreads: there is a discontinuous focal development in parts or throughout the whole body. According to some[4] the lesion is essentially a progressive proliferation or hyperplasia of the reticulum which is stimulated to unceasing growth with or without differentiating. Metastasis and infiltration do not occur in the non-malignant forms, but colonisation by cells takes place when free living cells, such as lymphocytes and myelocytes, are involved. The cause of this type of lesion is unknown and no attempt at experimental reproduction has yet been successful save in the case of the fowl leukæmias.

This group of diseases is one which, because of its difficult histological structure, is liable to be ignored in experimental work. The effect on abdominal and uterine plain muscle of an endocrine imbalance in guineapigs suggests a method by which these other cell proliferations might be investigated.

1. Lipschütz, A., and Vargas, L., *Lancet* 1939 **1**, 1313.
2. Lipschütz, A., Murillo, R., and Vargas, L., *Ibid*, Aug. 19, 1939, p. 420.
3. *Ibid*, 1939, **1**, 1329; Aug. 19, 1939, p. 438.
4. Robb-Smith, A. H. T., *J. Path. Bact.* 1938, **47**, 457.

NARCOTIC DRUG TRAFFIC IN THE UNITED KINGDOM

H.M. Government, like other governments (though not all) who are parties to the several international treaties dealing with the traffic in dangerous drugs, have furnished to the League of Nations a report for the year 1938. It would be well if all other governments could give an equally satisfactory account of the discharge of their contractual obligations. The control of international trade by way of import certificates and export authorisations continues to work smoothly, and the internal control of manufactured drugs by way of licences, inspection of factories and supervision of persons authorised to possess and use dangerous drugs works effectively and without friction. The seizures of opium illicitly imported which were eight in 1937, were four in 1938, and the amount confiscated was 0·75 kg. in the latter year compared with 0·79 kg. in 1937. Illicit import of Indian hemp however was discovered in fourteen cases in 1938 against seven in the preceding year and the amount seized was 2·34 kg. It is again reported that "addiction to narcotic drugs is not prevalent in the United Kingdom"; of the 519 addicts known to the central office 273 were women and 246 men. Of the total, 134 were members of the medical profession. The drug employed by addicts was morphine in 78·7 per cent. of the cases, heroine in 13·2 per cent. and cocaine in 0·5 per cent. The possession of "prepared opium" is wholly prohibited, its use in this country being chiefly among Chinese nationals temporarily resident here. In 1938 60,934 lb. of opium was imported into Great Britain and 153,464 lb. of coca leaves. In the same year 11,918 oz. of morphine and 1427 oz. of heroin were exported. The report repeats the assurance, made in former years, that "the evidence was forthcoming of any organised illicit traffic in the United Kingdom."

THE FATE OF ŒSTROGENS IN THE BODY

THE problem why diethylstilbœstrol has the same physiological activity as the natural œstrogenic hormones, to which it bears little chemical resemblance, is likely to yield a good crop of laboratory investigations. The latest of these [1 2] tend to show differences rather than similarities between the natural and synthetic series in regard to their chemical behaviour in the body. In the first place, stilbœstrol remains deposited at the site of injection, and is slowly absorbed from this depôt; in this it differs from œstrone and resembles the esters of œstrone or of œstradiol, which have been used to obtain prolongation of the action of a single dose. Secondly, when the circulation has been entered, compounds of the stilbœstrol family—stilbene and diphenylethane derivatives—are recoverable from the urine in comparatively large amounts, whereas œstrone is rapidly inactivated and is largely broken down or transformed to less active products. Means of mitigating the action of the natural hormone have long been elaborated by the body; but when the natural protective mechanisms for eliminating foreign compounds are applied to stilbene they result in the formation of the much more

1. Stroud, S. W., *Nature*, Aug. 5, 1939, p. 245.
2. Zondek, B., and Sulman, F., *Ibid*, Sept. 30, 1939, p. 596.

highly œstrogenic 4 : 4′-dihydroxystilbene. Thus, by administering 4 : 4′-dihydroxy-αβ-diethylstilbene (that is, stilbœstrol), we are getting under the guard of the body mechanism and giving it a compound against which it has not developed an adequate defence.

AIR-RAID SHELTERS

A LARGE number of occupancy tests in A.R.P. shelters for factory workers have been carried out by the staff of Messrs. J. and E. Hall of Dartford, with the assistance of medical and scientific advisers. Two kinds of shelter were used, each capable of holding 50 seated people, one being of steel, completely below ground level, and the other of pre-cast concrete, only partly buried. The objects of the tests were to determine the length of time before discomfort began when all exits were completely closed; to determine the changes in the temperature and humidity in these circumstances; and in general to note any data of interest and any methods of improving the comfort of the occupants. Apart from tests in the entirely closed shelters, the steel shelter was tested with an air-filtration plant in operation; with the exits ajar (as they would be during a raid were no gas used); and with added oxygen and soda lime. The types of shelter differed in two rather unexpected ways. The completely limed steel chamber is more comfortable because the surface temperature of the walls is governed by the temperature of the surrounding earth. The walls therefore absorb heat and keep the dry-bulb temperature within comfortable limits, and moreover provide a cold surface on which expired moisture can be condensed. On the other hand the walls of the concrete shelter seem to have absorbed carbon dioxide, for the concentration after two and a half hours' occupation was only 60 per cent. of the theoretical value. This, in the absence of any means of adding oxygen or subtracting carbon dioxide, might delay to an appreciable extent the onset of symptoms of carbon-dioxide poisoning.[1] The investigation brought no fresh facts to light, but it was none the less well worth the labour. It demonstrated practically that shelters can be constructed which can be fully occupied, though completely sealed, for two hours without damage to the occupants, or indefinitely if the doors can be left ajar, if filtration plant is fitted, or if adequate amounts of oxygen are provided at hourly intervals and soda lime is continuously exposed. The report, published by Messrs. H. K. Lewis at 2*s*., brings together in a simple way much information valuable to builders of shelters and is a timely warning to the careless that for long occupation some form of ventilation or of oxygen-enrichment is a necessity.

POLIOMYELITIS VIRUS IN SEWAGE

THE virus of poliomyelitis has on several occasions been isolated by the treatment of human fæces with volatile antiseptics, and Professor Kling in Sweden has lately recovered from drinking-water a virus which appears identical with that of the disease.[1] Now Paul, Trask and Culotta[2] have for the first time isolated the virus from sewage—at Charleston, South Carolina, where there was an epidemic of poliomyelitis from May to July this year. Samples of sewage from the part of the town where most of the cases had arisen were inoculated intraperitoneally into six monkeys. Two of the monkeys died of peritonitis and two of an infection of the abdominal wall; but the remaining two developed poliomyelitis, and from one of them the virus was successfully transferred to another monkey. Passage was not attempted in the other case because the monkey died on the third day of the disease.

1. See *Lancet*, Sept. 20, 1939, p. 753.
2. Paul, J. R., Trask, J. D., and Culotta, C. S., *Science*, Sept. 15, 1939, p. 258.

HÆMATURIA WITH M. & B. 693

IN our correspondence columns Dr. G. A. H. Buttle calls attention to the rarity of hæmaturia during treatment with M. & B. 693 in the cases reported from temperate climates as compared with the high incidence met with by Backhouse[1] in New Guinea. In their account of 100 cases of pneumonia treated with this drug (now becoming a classic) Evans and Gaisford[2] saw no hæmaturia, and in their paper on 280 pneumonia patients treated in South Africa, Agranat, Dreosti and Ordman[3] do not mention this complication at all. Römcke and Vogt[4] met with transitory hæmaturia in only 2 of their 342 collected pneumonia cases treated in Norway. On the other hand, Robertson[5] described a brisk hæmaturia in a boy with pneumococcal meningitis treated at Hampshire County Hospital, and McCann[6] of Belfast found red cells in the urine on routine microscopical examination in 29 of 65 men with gonorrhœa treated with the drug. Backhouse's findings were more definite: in 109 New Guinea natives he reports gross bleeding in 5 and red cells in 8 more; in 11 of these the hæmaturia was accompanied by pain and in most the urine was scanty. Gross bleeding with colicky pain has also been reported in Peiping by Snapper[6] et al. and in the United States.

The explanation of the bleeding seems clear. M. & B. 693 is excreted partly as the free base and partly in the inactive acetylated form, and the hæmaturia arises from the trauma of crystals of the acetyl derivative, which is relatively insoluble in an acid medium. The quantity acetylated in the rabbit is high, and it is easy to recover from the rabbit's urine considerable amounts of the crystalline acetyl compound if it is allowed to stand in an ice chest for some time. In human beings, however, the proportion acetylated varies greatly in different subjects, but when it is large, mechanical irritation of the kidney is always a possibility, particularly in febrile states where the urine is concentrated and acid. Backhouse was able to demonstrate crystals of M. & B. 693 derivatives in the urine of his cases, and Snapper and others have described actual renal calculi of the same constitution. Buttle suggests that the climate of New Guinea would tend to lead to a low output of highly concentrated urine. The complication is not a serious one, for the bleeding has usually been transitory, but its occurrence does emphasise the necessity for giving ample fluids and for reducing the acidity of the urine as far as possible when M. & B. 693 is being given, more particularly in hot climates.

Dr. W. ALLEN DALEY has been appointed medical officer of health for London in succession to Sir Frederick Menzies who is retiring on Nov. 2.

Dr. BEDFORD FENWICK, senior consulting gynæcologist to the Hospital for Women, Soho, and sometime editor of the *British Gynæcological Journal*, died in London on Oct. 14 in his 85th year.

We also regret to announce the death on Sunday of Mr. A. T. PITTS, who did much to enhance the prestige of dentistry in this country. He was well known alike as dental surgeon to the Middlesex Hospital, teacher at the Royal Dental Hospital and scientific editor of the *British Dental Journal*. He was aged 58.

1. Backhouse, T. C., *Lancet*, Sept. 30, 1939, p. 736.
2. Evans, G. M., and Gaisford, W. F., *Ibid*, 1938, **2**, 14.
3. Agranat, A. L., Dreosti, A. O., and Ordman, D., *Ibid*, Feb. 11, 1939, p. 309.
4. Römcke, O., and Vogt, M. D., *Ibid*, Oct. 7, 1939, p. 778.
5. Robertson, K., *Ibid*, 1938, **2**, 728.
6. McCann, J. S., *Ibid*, July 8, 1939, p. 100.
7. Snapper, I. et al., *Clin. med. J.* July, 1939, p. 1.

THE NEW ENDOCRINOLOGY

A series of articles by Prof. E. C. DODDS, F.R.C.P., *director of the Courtauld institute of biochemistry at the Middlesex Hospital, based on lectures delivered at the British Postgraduate Medical School*

III—THE MALE SEX HORMONE

THE study of endocrinology as we know it is of recent origin, but observations relating to the male sex hormone were made in very early times. From whatever motives castration in the human was effected, the results of the removal of the testis were noted, and the practice was deliberately extended to domestic animals. It is natural that efforts to counteract the results of castration should have been the first endocrinological problem to attract the attention of scientists.

Despite this fact, until comparatively lately all such attempts ended in failure, and progress in knowledge of the testis has been slower than progress in knowledge of other endocrine organs. This was mainly because the early workers expected testis-tissue to yield a high concentration of the male hormone; whereas it is now realised that, unlike other endocrine organs, the testis tissue contains the hormone in such low quantities that it is extremely difficult to detect.

The first recorded attempt at testis transplantation is that of John Hunter, working on hens, in 1762; but it was not until the middle of last century that real evidence of an internal secretion was obtained, through the work of the German Berthold, who in 1849 demonstrated that he could induce comb-growth in the capon by the injection of testicular material. A. Pézard further elaborated his work, and since that time the capon has been the test-object. Various useful methods of quantitative assay based on the capon-comb-growth-reaction for the activity

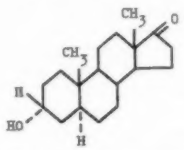


FIG. 1—Androsterone

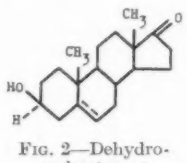


FIG. 2—Dehydro-androsterone

of androgens were established, following the work of U. C. McGee, and the discovery that men's urine is a good source of androgens prepared the way for rapid advances by the biochemist.

The first really valuable series of experiments were those carried out by F. C. Koch and his collaborators in Chicago, who showed that an alcoholic extract of bull's testes will cause comb-growth in the capon.

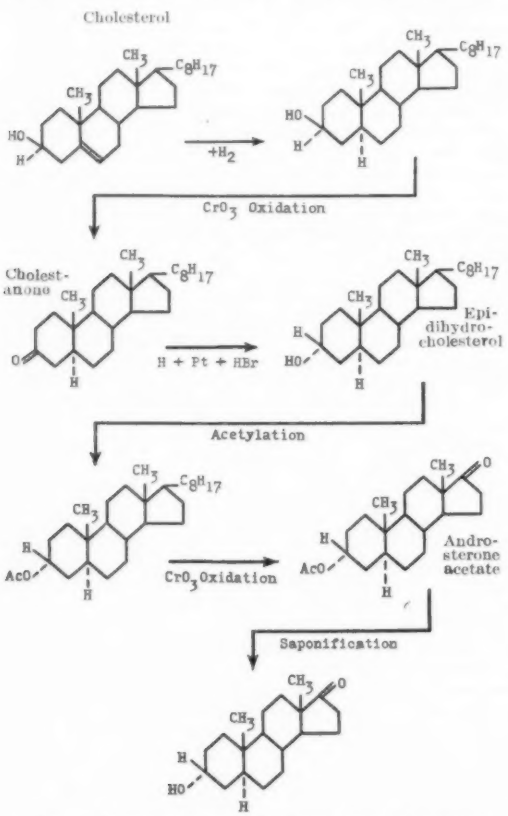


FIG. 4—Preparation of androsterone from cholesterol (Ruzicka)

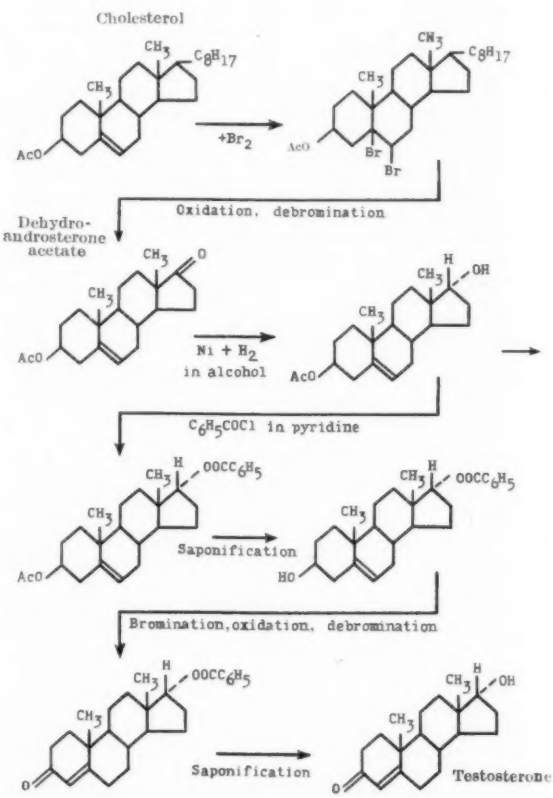


FIG. 5—Preparation of testosterone from cholesterol (Ruzicka)

This was followed by the crystallisation of androsterone obtained from human urine by A. Butenandt, and he and his co-workers gave the formula for this and for dehydro-androsterone, which they also obtained from human urine. L. Ruzicka and his associates then succeeded in their attempt to produce androsterone by the synthetic degradation of cholesterol. Its formula and that of dehydro-androsterone are shown in figs. 1 and 2. It was established that androsterone will produce comb-growth in the capon and enlargement of the seminal vesicles and external genitalia in the castrated rat; but its potency proved to be very low, and considerable amounts were required to produce any response.

Despite this low potency, it was at first thought that the solution of the problem of the male hormone had been found in androsterone and dehydro-androsterone, and that they were the active testicular secretion. But the Americans Koch and Gallagher produced from bull testis-tissue substances which were 5–10 times as active as androsterone, and they also showed that while alcoholic potassium hydroxide destroys testis-tissue, it does not affect the androgenic concentrates from urine. As a result of these observations, David and Laqueur succeeded in separating from bull testis-tissue another androgenic substance, testosterone (fig. 3). Butenandt and Ruzicka, working independently, very soon afterwards produced the same substance by the synthetic degradation of cholesterol.

In my last article I referred to the great importance of the work of the German school on the structure of sterols: until the configuration of these substances was worked out no progress could be made on the sex hormones. The sterols, consisting as they do of a cyclopentenophenanthrene nucleus with a tie-chain attached at the 17 carbon atom and various double bonds and polar groups distributed throughout the nucleus, present very suitable starting material for the degradation synthesis of the hormone. This method of approach has been of the utmost value in the case of the androgenic substances.

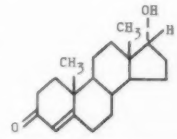
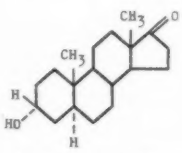


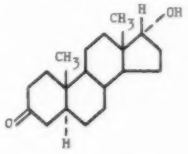
FIG. 3—Testosterone

As stated above, a fundamental difference was found by Koch and Gallagher between the action of alkali on androgens extracted from the testis and from the urine. The destruction of those from the testis suggested that the grouping of double bonds and polar groups might be the same as in the other alkali-labile steroid hormone, progesterone. Attempts were made, therefore, to prepare substances with a double bond in the 4 position and with a ketone group in the 3 position—that is to say, substances

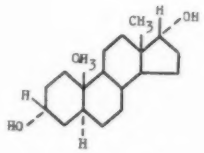
FIG. 6—SOME SATURATED ANDROGENS



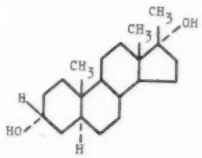
Androsterone (from men's urine) (100 γ)* (500 γ/10/68 mg.)†



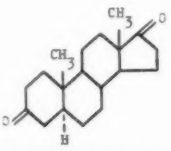
Androstanolone-17 trans, 3 (not found in nature) (25–30 γ) (rat test ?)



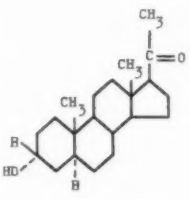
Androstanediol-3 cis, 17 trans (not found in nature) (20–35 γ) (100 γ/10/43 mg.)



17-Methyl (cis)-Androstanediol-3 cis, 17 (not found in nature) (25–40 γ) (200 γ/10/35 mg.)

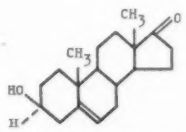


Androstanedione-3, 17 (not found in nature) (120–125 γ) (200 γ/10/29 mg.)

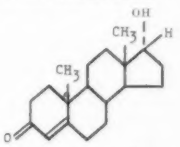


Epi-*allo*-pregnanolone-3, 20 (from ♀ women's pregnancy urine) (androgenic in capons and rats)

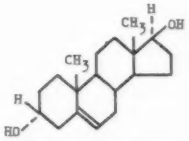
FIG. 6A—SOME UNSATURATED ANDROGENS



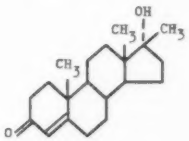
Dehydroandrosterone (from men's urine) (250–300 γ) (500 γ/10/16 mg.)



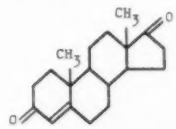
Testosterone (from bull testis-tissue) (13–16 γ) (50 γ/10/150 mg.)



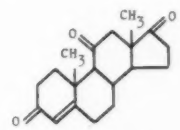
Δ^5-Androstenediol-3 trans, 17 cis (not found in nature) (235–650 γ) (2000 γ no action in rat)



17-Methyl (cis), Testosterone (not found in nature) (10–15 γ) (rat test ?)



Δ^4-Androstenedione-3, 17 (not found in nature) (100–120 γ) (100 γ/10/50 mg.)



Adrenosterone (from suprarenal cortex and from cortical hormone by oxidation) (500–600 γ) (rat test ?)

* Equivalent of international unit on capon
† Per day for 10 days in rat with weight of seminal vesicle in milligrammes

of the type of Δ^4-androstenone-3. The method of sterol disintegration was applied with great brilliance and success by Ruzicka and his co-workers, and also by Butenandt. These methods are so complex that it would be out of place to consider them in detail here. It suffices to say that, from inert sterols such as cholesterol, Δ^4-androstenolone-17,3 was prepared, and was found to be identical with testosterone. Figs. 4 and 5 indicate the method for the preparation of androsterone and testosterone respectively from cholesterol.

By the application of this type of method some sixty androgenic substances have been prepared. These may be classified into saturated and unsaturated substances, and the formulæ set out in fig. 6 indicate the relative potency of a number of them.

To date six naturally occurring androgens have been discovered—four of them in human urine, although only androsterone and dehydro-androsterone have been isolated from normal male urine. Normal women also excrete large quantities of androgenic substances in urine, but no pure androgen has as yet been isolated from the urine of non-pregnant females. The yield from urine has been found to be greater than was estimated by the early workers, and through improvement in methods of extraction it is now accepted that the daily yield in urine for a normal man is 40–100 international units. Koch and his collaborators have shown that the excretion of androgens is extremely low in immature humans, and that adult humans are unique in excreting large quantities of the male hormone in urine, animal urine containing proportionately very much smaller quantities. They found great variations from day to day in the amount excreted by individual men and women, and it would obviously be dangerous to base any assumptions on the amount of androgen excreted by a single person over one or two 24-hour periods, the only safe method being to average the results of the extraction from the urine collected over periods longer than three days.

In pathological cases the excretion of androgens may be very greatly increased. R. K. Callow isolated as much as 110 mg. of dehydro-androsterone from 1 litre of urine from a girl of six who was suffering from an adrenal tumour. The normal excretion would be between 2 and 10 international units a day, whereas this child was excreting about 600 international units daily. So far it has not been possible to differentiate between the quantities of the different androgens excreted, but only to estimate the total activity. This applies to androgens obtained from tissue and body fluids as well as from urine.

All attempts to increase to any considerable extent the yield from testis-tissue, which the earlier workers thought would prove to be the richest source of androgenic substances, have failed, and normally 3–9 international units are obtained per pound of bull testis-tissue, or 90–270 mg. per ton of tissue. It is a curious fact that the testis-tissue of calves and fœtal calves gives a higher yield of androgens than does that of the mature bull.

Another early idea that has proved inaccurate was that blood contained larger quantities of the male hormone. Koch after a careful study now estimates the content at only 4 international units per litre of blood.

No connexion between the excretion of androgens and œstrogens in men and women has been demonstrated, although it has been noted that the excretion of both substances falls in women during menstruation. The rise at regular periods in the menstrual cycle of the excretion of œstrogens is not apparently associated with a similar rise in the excretion of androgens.

It is accepted that the source of the androgenic and œstrogenic substances excreted in the urine is the gonads; but other organs, notably the suprarenal glands, may yield substances with androgenic activity.

One of the chief difficulties in obtaining accurate observations lies in the lack of the perfect test-object. E. Laqueur and his collaborators called attention at an early stage to the great fluctuations in results obtained by rat assay. They later showed that the addition of a non-androgenic factor from testis-tissue to a given amount of testosterone will increase the seminal-vesicle weight-response by three to four times. This unknown factor Laqueur called the "X-substance" and its nature has not yet been established. A number of pure substances—such as various fatty acids, œstrogens and primary alcohols—can be added to testosterone with the same increase of response. On the other hand it has been found that glycerol and paraffin oil are capable of decreasing the seminal-vesicle weight-response. The issue is further complicated by the fact that not all androgens are similarly affected by the addition of these substances. The potency of testosterone can be increased by esterification, and the most important of these esters is the propionate, which is widely used by clinicians. The effect of the propionate on the weight of the seminal vesicles is three or four times that of free testosterone.

The capon-comb-growth test does not reveal the effects of the addition of fatty acids and alcohol to testosterone, or of esterification; but the capon responds more exactly, weight by weight, both for androgens and for testosterone, and it seems to be a better medium than the castrated rat for a purely quantitative assay of total activity.

VITAMIN C AND THE AGEING EYE

S. M. Bouton, of Detroit, before investigating the effect of vitamin C as a factor essential to the health of certain ocular tissues, worked on the relationship between the blood level of vitamin C, its urinary excretion, and the condition of the optic media with and without vitamin-C therapy (*Arch. intern. Med.* 1939, **63**, 930). The whole subject is somewhat controversial, but Bouton accepts 25 mg. as the daily intake of ascorbic acid required for health. Some authorities, he says, give the total ascorbic-acid content of blood as 1·11–2·88 mg. per 100 c.cm.; C. J. Farmer and A. F. Abt are quoted as finding 0·69–2·36 mg. per 100 c.cm. of blood plasma, and J. Bellows 1·02 mg. in normal persons and 0·605 mg. in those with cataract. The daily urinary excretion is between 20 mg. (lower limit of normal) and 15 mg. (minimum).

Bouton investigated 12 patients whose ocular media were cloudy and in whom there were senile ocular changes and vitamin-C deficiency. These patients he divided into two subgroups: (*a*) treated with massive doses of ascorbic acid for eight weeks and (*b*) treated similarly for four weeks. The levels of ascorbic acid in the blood plasma were determined during treatment and a week after it, and the 24-hour excretions in the urine during the last week of treatment and a fortnight later. There was visual improvement in all patients not primarily affected with senile cataract; 7 of the 12 showed considerable improvement within the first two weeks of treatment, progress being slow or unchanged from then onwards. The treatment had no effect on cataract. Bouton says that recent work suggests the probability of a direct effect of ascorbic acid on the media, retinal vessels, optic disk, and optic nerve.

SPECIAL ARTICLES

PRINCIPLES OF ARTIFICIAL RESPIRATION IN FIRST-AID

BY ESTHER M. KILLICK, M.Sc., M.B. Leeds, M.R.C.P.
E. M. COWELL, D.S.O., M.D. Lond., F.R.C.S., D.L.
AND G. P. CROWDEN, D.Sc. Lond., M.R.C.P.

(*From the London School of Hygiene and Tropical Medicine*)

NOWADAYS asphyxia, due to the inhalation of carbon monoxide, or electric shock, has become relatively common, while drowning is no less rare than it was. Carbon-monoxide poisoning whether accidental or suicidal is an emergency which may confront any individual; since as a rule artificial respiration is immediately required it is essential that sound practical instruction in its technique should be part of the education of the citizen. The need for this instruction is emphasised by the statistics for deaths from asphyxia in England and Wales issued by the Registrar-General (table I). These figures of course do not reveal the number of cases of asphyxia which are successfully resuscitated. They are however enough to show that the deaths from asphyxia due to carbon monoxide and electricity is steadily increasing.

TABLE I—DEATHS FROM ASPHYXIA IN ENGLAND AND WALES BETWEEN 1930 AND 1937

Causes of death	Number of deaths per year							
	1930	1931	1932	1933	1934	1935	1936	1937
Gas poisoning—								
Suicide	1351	1451	1807	1732	1864	1779	1771	1785
Accidents.. ..	150	177	200	164	176	200	254	246
Total.. ..	1501	1628	2007	1896	2040	1979	2025	2031
Drowning—								
Suicides	887	913	999	885	807	746	762	806
Accidents.. ..	739	685	833	925	600	821	679	781
Total.. ..	1626	1598	1832	1810	1407	1567	1441	1587
Electricity—								
Accidents.. ..	68	56	55	70	67	70	80	79
Mechanical suffocation—								
Accidents.. ..	474	428	422	392	411	389	429	463

It is suggested that practical instruction in artificial respiration should be incorporated in the school curriculum for every boy and girl. In addition, special training should be given where the risks of asphyxia are increased, for example in mines and in many industries, and where there is a risk of drowning, as on bathing beaches and at swimming baths. We are convinced that the presence of trained personnel would save many lives.

HISTORICAL RESUME

The idea of restoring life to the apparently dead can be traced far back into history. Drinker (1938) reminds us that the successful use of the method of mouth-to-mouth insufflation was recorded in the Old Testament, and that the Chinese have for many centuries treated the apparently drowned by up-ending them and jerking them up and down. Dr. Stephen Bradwell (1633), in one of the first books written in English on first-aid, describes a somewhat similar method. For those apparently drowned, he advises "Turn the feete upward, head and mouth downward and so hold by the heels that the water may come out," then "let others help forth the water by stroaking, crushing, and driving his belly and stomach reasonably hard, from the bottom of his belly toward his throat. If it be cold weather let all this be done in a warme roome before a good fire."

In 1857 Dr. Marshall Hall described a method of artificial respiration in which the patient was rolled on his side to induce inspiration, and then turned to the prone position and pressure applied to the lower part of the thorax and abdomen to produce expiration. In the following year Dr. Silvester published his method, which soon supplanted Marshall Hall's. In 1862, a committee of the Royal Medical and Chirurgical Society of London was appointed and issued several reports during the ensuing 40 years. In 1904 in its last report the method introduced by Schäfer was described. Since then a number of modifications have been introduced, but the methods first described by Silvester and by Schäfer remain in most common use.

PHYSIOLOGICAL PRINCIPLES

In comparing the efficiency of different manual methods of artificial respiration too much stress has often been laid on the volume of ventilation produced. This is clearly important, but it is only a means to an end. In a person apparently dead from asphyxiation, whether due to drowning, electric shock, poisoning, or any other cause, the urgent need is to get a sufficient supply of oxygen to the vital centres of the brain before irreparable damage is done to the nerve-cells. This involves at least two other factors besides the ventilation of the lungs with fresh air—namely, the passage of oxygen across the alveolar membrane into the blood, and the circulation of this oxygenated blood through the brain. The ventilation of the lungs, therefore, must be carried out in such a way that the fresh air penetrates right into the alveoli. For this to occur, the volume of air passing into the lungs with each respiration must be above a certain minimal value. This minimum will vary according to the build and lung-volume of the individual, but it may safely be assumed that a volume per breath of 400–500 c.cm. will satisfy the vast majority of people. The first criterion of an efficient method of artificial respiration is then that it should produce a volume of ventilation per breath of at least 400–500 c.cm. In some types of asphyxia, such as that due to carbon monoxide, it is desirable to increase the pressure of oxygen in the lung alveoli above the normal level, so as to hasten the removal of the noxious substance from the blood. It is then an advantage to be able to produce a degree of ventilation considerably above the minimum.

The second essential factor is the circulation of the blood. The movements utilised in performing artificial respiration should therefore be such as to increase the circulation of the blood.

The next consideration is the passage of oxygen from the blood to the tissues. The ease with which the blood gives up its oxygen depends in the first place on the difference between the pressure of oxygen in the blood and in the tissues; after a period of asphyxia this difference is likely to be considerable, since the oxygen pressure in the tissues must be low as a result of the continuous consumption of oxygen.

The dissociation of oxygen from hæmoglobin depends among other things on the temperature and blood carbon-dioxide content. Most forms of asphyxia are associated with a lowering of the body temperature which retards the dissociation of oxygen from the blood. Further, when artificial respiration is performed, it is quite possible to reduce the carbon dioxide in the blood below its normal limits. This happens the more easily because the unconscious individual, with his muscles relaxed and his body temperature low, is producing less carbon dioxide than usual. If the carbon dioxide in the blood is thus reduced the dissociation of oxygen from the blood is seriously hindered. We may therefore add to our criteria of efficient artificial respiration that the method must be such as to conserve body warmth, and that it must not so over-ventilate the lungs that too much carbon dioxide is removed.

The body temperature is normally maintained by a balance between the heat produced by metabolism and the heat lost from the body in various ways. During asphyxia heat production is diminished, as a result of cessation of movement in the unconscious patient, and also because lack of oxygen modifies the metabolic processes. Heat loss, however, continues and may even be increased, as for example by evaporation from the wet skin and clothing after immersion in water. It is therefore of great importance to prevent this loss of heat as far as possible by avoiding undue exposure and by the use of additional coverings such as coats or blankets; in addition any available source of additional heat should be utilised.

The second main purpose of artificial respiration is to induce natural breathing to commence once more. To achieve this it is, of course, necessary to get oxygenated blood circulating through the nerve centres that control natural breathing, but it must also be remembered that the natural chemical stimulus to respiration is carbon dioxide. This is another reason for avoiding over-ventilation of the lungs, for if the degree of ventilation is such that carbon dioxide is removed faster than it is produced in the body, then the most potent stimulus to natural breathing is being taken away.

Breathing is regulated through the respiratory centre and the nerves connected with it. In certain conditions, such as injury to the skull or nervous diseases like infantile paralysis or diphtheritic paralysis, this nervous control of respiration breaks down, and breathing becomes very weak or ceases altogether. The prompt application of artificial respiration in such a case may keep the patient alive until the nervous system recovers sufficiently for the normal control of breathing to be resumed. These patients are usually treated in hospital, but the respiratory paralysis may be rapid in onset and so constitute an emergency requiring first-aid treatment.

GENERAL TREATMENT

As has already been mentioned, it is very important to keep the patient as warm as possible, and to avoid undue exposure, not only to aid hæmoglobin dissociation, but also to combat shock. Shock may be associated directly with the asphyxia, but the patient may have sustained other injuries which aggravate it. These may need first-aid treatment, but asphyxia is the primary emergency.

Consideration should also be given to the position of the patient; where the ground is sloping the patient should be placed with his head lowest, since this assists the circulation of the blood to the brain, and in cases of drowning it helps to drain the water from the lungs. An exception to this rule is that the head should be higher than the feet when the patient has a fracture of the base of the skull, as it is then desirable to decrease the supply of blood to the head. If the surface of the ground is rough, the patient should be placed on a coat or rug to protect his skin from abrasion caused by the movements of artificial respiration.

Oxygen and carbon dioxide mixtures are of great value in resuscitation. In asphyxia due to carbon monoxide, it is essential to raise the oxygen tension in the lungs and blood to free the blood of carbon monoxide as rapidly as possible. Hill and Flack (1908) suggested the inhalation of carbon dioxide in such cases to increase the pulmonary ventilation, and later Henderson and Haggard (1920, 1922) advised a mixture of carbon dioxide and oxygen in resuscitation. The carbon dioxide increases the volume of breathing; the high proportion of oxygen in the mixture, together with the increased breathing, raise the tension of oxygen in the lungs and in the blood, and the elimination of carbon monoxide is thus considerably hastened. A mixture of 7 per cent. carbon dioxide with 93 per cent. oxygen is now very generally used in carbon monoxide asphyxia, with excellent results. It may be administered through a mask while artificial respiration is being applied. Inhalation of this mixture may be useful in other cases where respiration has failed, for the carbon dioxide stimulates the respiratory centre to initiate spontaneous breathing.

MANUAL METHODS IN COMMON USE

A manual method of artificial respiration must satisfy certain requirements if it is to be efficient and successful. It must produce adequate ventilation of the lungs, without over-ventilation. The movements should be such as to increase the circulation of the blood. It must not chill the patient or cause him any mechanical injury. It must be easy to learn. And it must be easy to apply and to maintain without unduly exhausting the operator.

The first three requirements have already been discussed. The question of ease of application and the simplicity of the movements is important, for 9 times out of 10 artificial respiration is applied by someone who has no knowledge of anatomy or physiology, but who has learnt the necessary movements as a method of driving air in and out of the chest. The more difficult the movements are to learn, the greater is the danger that they will be wrongly performed, and that injury to the patient will result. Obviously the movements should not be too exhausting for the operator, since it sometimes happens that one individual must continue to apply artificial respiration for a long time.

Many figures have been published showing the volume of ventilation produced by the different manual methods; some of the results have been obtained on conscious healthy subjects, who tried to inhibit their natural breathing whilst artificial respiration was being applied, while some have been obtained during the period of apnœa following forced breathing. A few results are recorded from applying artificial respiration to a corpse while it is still warm. Working with a conscious subject Schäfer found that his prone pressure method produced a pulmonary ventilation about 3 times as great as that produced by Silvester's method. We have ourselves investigated several methods on conscious subjects; one of us (Crowden 1936) has published results which show that the ventilation produced by the Schäfer and Nielsen methods was very similar, while that produced by Silvester's method exceeded both the others. One

of us (Killick) had an opportunity of comparing the ventilation produced by the Schäfer and Silvester methods when applied to a number of medical students; the conditions were not so carefully controlled as in Crowden's measurements, but the two methods were compared on 16 students with the results shown in table II.

TABLE II

No. of students	Rate per min.	Silvester's method		Schäfer's method	
		Average ventilation per min.	Average tidal air	Average ventilation per min.	Average tidal air
5	12	11·0 litres	917 c.cm.	7·3 litres	608 c.cm.
11	15	11·3 ,,	750 ,,	11·8 ,,	790 ,,

These figures indicate that the ventilation obtained by Silvester's method is at least as great, and sometimes greater than that obtained by Schäfer's method. The efficiency of the ventilation in oxygenating the blood, however, must depend not only on its total volume, but also on the volume of air remaining in the lungs, with which the tidal air is diluted. It is important, therefore, to know the mid-position of the chest during the application of artificial respiration. Crowden's results indicate that the mid-position during Schäfer's method is nearer to full expiration than it is during natural breathing in the prone position, whereas during Neilsen's method it is nearer to full inspiration. The mid-position during the application of Silvester's method is almost the same as it is during natural breathing in the supine position. King (1938) confirmed Crowden's results on the mid-position of the chest in the Schäfer and Nielsen methods, but his results also demonstrate that in spite of the alteration in the mid-position during artificial respiration by Schäfer's method, the position of the chest at the end of inspiration is about the same as it is during normal breathing, because of the increased volume of the tidal air.

With regard to the effect of the movements on the blood circulation it is very difficult to obtain evidence on the human subject as to which type of movement is the most effective. Any type of movement which induces ventilation of the lungs by a rhythmic alteration in the capacity of the thorax is likely to help, and it has been shown that pressure on the thorax produces movement of the blood in the veins and in the pulmonary vessels. Some workers claim that the method of Silvester is more effective than that of Schäfer in this respect, but the evidence is not very convincing. A more important point in favour of Silvester's method is that the supine position lends itself to the application of "heart massage" more readily than does the prone position, although the efficacy of this massage is by no means proven.

Schäfer's method is in general use in England and in the U.S.A., and it is considered to have the great advantage over Silvester's method that it is easier to train people to apply it correctly, and also that it is less exhausting to the operator and can therefore be continued for a long period by a single individual. Some authorities hold that there is more risk of injury to the patient with Silvester's method. In Schäfer's method there is no risk of injury unless very heavy pressure is used, when it may be possible to fracture a rib.

The method of choice varies from country to country, and when there are several methods available that fulfil the basic requirements of efficiency, the choice of the method becomes less important than the technique of administering it. Whatever manual method be selected, the movements should be correctly taught, with due regard for the anatomical and physiological facts on which the technique is based.

MECHANICAL DEVICES IN FIRST-AID TREATMENT

Where the apparatus is available there are certain mechanical methods which are valuable in an emergency. The postural displacement methods are the most suitable for first-aid work. This principle has found practical application in Eve's rocking stretcher (1932) and one of us (Cowell 1937) has since introduced a special frame on which any stretcher can be placed and tilted by a single operator. The operation of either method is very easy, and requires hardly any previous training. Experiments have shown that tilting at a rate of 12 tilts a minute produces an adequate ventilation of the lungs, and since the method has been employed in practice a number of successful results have been reported. The method has the advantage that artificial respiration can easily be maintained during a long period and even when operated by an untrained person it cannot injure the patient.

The great disadvantage of these methods, and of other methods needing apparatus, is that the equipment is so frequently not at hand when the emergency arises. If such methods came into general use the result would be a tendency in an emergency for people to wait for the equipment to be obtained, instead of applying a manual method of artificial respiration immediately. Such methods can never remove the necessity for efficient instruction in the technique of manual artificial respiration. The more elaborate mechanical methods of artificial respiration, such as the Bragg-Paul pulsator and the Drinker respirator, while invaluable in hospital, are quite unsuitable for first-aid treatment.

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". . . It is anadvertently affirm'd in the Christian Countries of Europe, that the English are Fools and Madmen. Fools, because they give their Children the Small-Pox to prevent their catching it, and Mad-men, because they wantonly communicate a certain and dreadful Distemper to their Children, merely to prevent an uncertain Evil. The English, on the other Side, call the rest of the Europeans cowardly and unnatural. Cowardly, because they are afraid of putting their Children to a little Pain; unnatural, because they expose them to die one Time or other of the Small-Pox."—VOLTAIRE in "Letters concerning the English Nation," London, 1733.

MEDICINE AND THE LAW

The Cash Value of Human Life

LAST week Mr. Justice Oliver had to consider the effect of war risks upon the expectancy of life. A negligent motorist was to pay damages to a widow for the death of her husband aged 31. Had the dead man been alive and well today, his chance of living out the normal human span might have been cut short by death or injury on war service abroad or by aerial bombardment if he stayed at home. Current events may turn the tribunal towards optimism or pessimism. "Suppose," said the learned judge, "an air-raid warning were given at this moment and the court were cleared while in course of considering this very point, or suppose again that the argument lasted two days and by some miracle peace were declared in the night: would the estimate of the widow's loss fluctuate in consequence?" Assessing the damages at £2250 for the widow and £750 for her two children, he let it be known that he had taken into account the war risks of the moment.

Baron Park said long ago (in Armsworth *v.* S.E. Railway) that it was considered impossible to form an estimate of the value of human life. Today judicial authority deems the task not impossible but merely difficult. Events, and especially the advent of the motor-car, have thrust this difficulty upon the courts. In 1934 the Law Reform (Miscellaneous Provisions) Act allowed a dead man's rights of legal action to survive for the benefit of his estate. It was no longer more profitable for the peccant motorist to kill his victim than merely to maim him. Whether death occurred or not, the injury could become the basis of a claim for damages on the ground that the victim's expectancy of life had been shortened. Flint *v.* Lovell (1935) was the first of the cases to give prominence to this new element in litigation. A man of 70, in good health, leading an exceptionally active life, met with traffic injuries which reduced his expectancy of living to a single year. He had lost, said Mr. Justice Acton, the reasonable hope of an enjoyable, vigorous and happy old age which might have continued for several years more. The court was sympathetic and gave him as much as £4000. It had not yet been solidly decided that the shortening of one's own life could be taken into account as a separate item of damage in a claim on one's behalf while one is still alive. An appeal counsel contended that it could be considered only in so far as one's suffering is increased by knowledge of one's impending death. This argument would seem to imply that the doctor has it in his power to negative the claim for damages by not telling patients how ill they are. The Court of Appeal ruled that the shortening of a man's life is a detriment for which he can claim damages while living. A learned legal critic, the late Sir Frederick Pollock, criticised the decision in the *Law Quarterly Review*. He was willing to concede that expectation of life is a thing of temporal value, though not assignable, being—on a sufficiently large average—calculable and indeed of the very essence of life insurance. But he did not like the way in which the lords justices had approached the problem. No human tribunal, he maintained, could attach any definite meaning to the terms used, or, for the matter of that, could say whether death, when it comes, is in itself a bad or good thing. To return, however, to the amount of the award, Lord Justice Greer thought the £4000, "though somewhat on the generous side," not so exaggeratedly large a sum as to require interference on appeal. On the other hand, Lord Justice Roche (now Lord Roche), in a minority judgment, declared himself satisfied that the sum was much in excess of the proper figure and was an entirely erroneous estimate. "If this plaintiff's case merits £4000," he observed, "I do not see how or by what sum a similar shortening of the life of a young man or a middle-aged man could be adequately met." Moreover he felt there was a risk of plaintiff's being given compensation twice over for the same injury. Even Lord Justice Roche was ready to put the figure as high as £3000. He was, however, overruled by the other two members of the tribunal, who left it at £4000.

Two years later came the case of Rose *v.* Ford. Miss Ford, aged 23, was seriously injured in a traffic accident; her leg required amputation and she died four days after the accident, having been unconscious most of that time. Her father claimed damages under three heads:—(i) the damages she would have received, if she had lived, for her pain and suffering, (ii) the damages for the loss of the leg, and (iii) the damages for shortened expectancy of life. Humphreys, J., gave her £300 under the Fatal Accidents Acts in respect of the first head of claim, and £500 for the loss of the leg; he rejected the claim under the third head altogether. The Court of Appeal revised these figures. It awarded the father £20 for the four days of suffering, and nominal damages (40*s.*) for the loss of the leg because she had survived the amputation by only two days. The Court of Appeal confirmed the view that nothing was due for the shortening of her life, but here the House of Lords took a different view. Lord Atkin declared that the loss which occurs when the period of a man's normal expectation of enjoying life is shortened can be estimated in terms of money; judges and juries must make the effort to estimate it. On the broad question of liability Lord Wright laid down the principle that a man has a legal right in his own life; he has a right to complain if the integrity of his life is impaired by a defendant's negligence—not only in respect of pain, suffering and disability, but also in regard to the deprivation of the continuance of life for the normal span. As a man has a legal right that his life shall not be shortened by another's wrongful conduct, so he is entitled to damages. But how should the damages be determined? The jury, said Lord Wright, should give what is fair and moderate in view of all the uncertainties and contingencies of the human lot. Special cases might occur, such as that of an infant or an imbecile or an incurable invalid or a person involved in hopeless difficulties. The judge and jury must do the best they can in the circumstances in this as in other cases. Lord Roche followed on the same lines, though with some misgiving. He felt that the discussion would lead into paths of abstruse thought and technicalities of law far removed from the practical directions which judges have to give to themselves or to juries for the purpose of answering questions of amount. He agreed that damages must be moderate; they must be based on normal instances. Any supposed difference of estimate as between rich or poor must be eliminated. Regard must be paid to the average. "A rich miser living in squalor or a very poor man deeply sunk in misery might require special treatment." It must be assumed that the ordinary man or woman possessed or earned enough to live on with enjoyment. Apart from this state, earnings and income could be disregarded. Lord Roche conceded that the emphasis of this new element in the law-courts might lead to inflated damages in undeserving cases; the phenomenon might become stale and ridiculous to the detriment of real and deserving claims. But the abatement of these potential evils

must be left to the good sense of judges and jurymen. He himself thought a jury a good enough tribunal for the purpose. So the appeal was allowed; the £22 which the Court of Appeal had given was increased by £1000.

There was one more case last year where these somewhat metaphysical speculations were resumed. In Roach *v.* Yates a bricklayer aged 33 was knocked off his bicycle and received severe injuries to the brain. He was rendered permanently unfit for work; he was no longer able to look after himself but would require the aid of a nurse by night and day; and his expectation of life had been reduced from thirty to ten years. He was awarded £542 for his pecuniary losses and expenses and a total of £2742 including all other damages. The Court of Appeal held that a proper method to adopt would be to give the plaintiff (i) £542 as awarded, (ii) a sum not less than £2000 for his prospective loss of wages which he might have earned in the course of a normal period of life, (iii) another sum not less than £2000 for nursing and attendance sufficient for reasonable weekly payments over the estimated period of his shortened life, and (iv) a further sum for his past and future physical and mental pain and the shortening of his life. In assessing the damages under this fourth head the Court of Appeal thought that two points should be kept in mind—first, that no amount of money could ever fully compensate the plaintiff: the most that could be done would be to give him some reasonable sum; and secondly, that no deduction should be made because in consequence of the accident he might be unable to appreciate the shortening of his life or even might be glad that it had been shortened. The Court of Appeal put the total award at £6542. Lord Justice Greer said that the sum fixed in the trial court was quite inadequate. Of course, if the Court gave him £10,000, or even £20,000, it would not be giving him something which he would rather have than the continuance of his healthy life; however, the Court must be reasonable. Lord Justice Slesser stressed the need of deciding on a normal basis. "We are not to speculate as to what would have been the result if the evidence showed the plaintiff to be a man of atrabilious temperament or a follower of Schopenhauer or of suicidal tendency." And so the courts must continue their daily task of evolving the "ordinary reasonable man" and evaluating his vital expectancy. If the injured person be an infant, would it have survived the ailments of infancy? Would the child grow up to be a film star or a habitual criminal? Judges and juries may be invited to let their fancy range from one extreme to the other; their duty is to be moderate and reasonable. They must have regard to the facts of life, happy or otherwise. Sixty years ago, in Phillips *v.* L. & S.W. Railway, Lord Justice James had to discuss the case of a Grosvenor Square physician injured in a train accident. The jury, he thought, should take into account the chance of the plaintiff retiring or even failing in his practice. Perish the thought that, even in these uncomfortable days of war, professional failure should be part of the practitioner's normal expectation of life.

OXYGEN AND NITROUS OXIDE.—The Ministry of Health reminds consumers that it is contrary to the national interest to hoard oxygen and nitrous oxide cylinders, whether filled or empty. Adequate existing supplies can only be ensured if cylinders are kept in constant circulation. Empty cylinders should be returned with the minimum of delay to the suppliers.

BLOOD-GROUPS EXPLAINED

WHEN we were young, blood-grouping was very simple. We remembered Moss and forgot Jansky. Group 1 was the universal recipient (and was rare), while Group 4 was the universal donor (and was common). Groups 2 and 3 were easy. Since then, science has marched on, and we now base our classification on "agglutinogen-content," and, by manipulating the letters A, B and O, produce something which might confuse even the most cunning War Office decoding expert. At last, Mr. Amram Scheinfeld,[1] writing for the intelligent layman, has cleared it all up.

The four blood-groups depend upon three genes A, B and O. Each person's blood-group is determined by his receiving two genes, one from each parent. The genes received may be the same or different. Gene A produces "antigen A"; gene B produces "antigen B"; while gene O produces no antigen but only certain less potent substances. Genes A and B are of equal strength and when brought together work independently. Gene O, on the other hand, is recessive, and if coupled with A or B does not function. Accordingly:—

If a person receives genes	A + A or A + O	B + B or B + O	A + B	O + O
his blood-group is	A	B	AB	O

Which of these four groups is the universal recipient and which the universal donor? If we remember that A and B are antigens, while O is associated with less potent substances, difficulties vanish. Blood of the AB type can receive either A, B or the weaker O; whereas if it is given to any of these, one or both of its two antigens make it incompatible. Type AB is therefore the universal recipient. Blood O, containing neither of the potent antigens, cannot receive A, B or AB; it can, however, be given to any of the other three, as well as to other O-group owners. Type O is therefore the universal donor.

The old and new terminologies, together with the distribution of the groups, are summarised in the table.

Agglutinogen-title of groups	Moss	Jansky	Relative number of people in each group
AB (universal recipient)	1	4	5 per cent.
A	2	3	41 ,,
B	3	2	12 ,,
O (universal donor)	4	1	42 ,,

If the genetics underlying the blood-groups are borne in mind, the principles of paternity-testing can easily be understood. A baby has got to receive one of the three possible genes (A, B or O) from each parent. Further, each parent has a choice of two genes to offer the child (an A parent can give A or O, a B parent B or O, an AB parent A or B, and an O parent O only).

1. You and Heredity. By Amram Scheinfeld. Assisted by M. D. Schweitzer. Edited by J. B. S. Haldane. London: Chatto and Windus. Pp. 434. 12*s.* 6*d.*

It follows that,

If the baby's group is—	Parents must have given it—	So if mother was—	Father could not have been—
O	O + O	No matter which	AB
AB	A + B	No matter which	O
A	A + O or A + A	B or O	B or O
B	B + O or B + B	A or O	A or O

In addition to the A, B and O genes, two minor supplementary blood genes, M and N, have been discovered. These produce substances in the blood which, while having no effect on transfusions, can yet be detected and are therefore of value in paternity tests. Everyone carries two of these genes, M + M (M) or N + N (N) or M + N (MN). As a result:—

If a baby's supplementary group is—	Parents must have given it—	So if mother's supplementary group was—	Father could not have been—
M	M + M	No matter which	N
N	N + N	No matter which	M
MN	M + N	N	N
MN	M + N	M	M

The value of paternity tests is negative only, and such negative results are only obtained in about 20 per cent. of cases. A further difficulty is that the child's blood may not become "set" in its true type until as long as a year after birth. This difficulty can, however, usually be overcome.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE GROWTH OF SURGERY

PROF. J. R. LEARMONTH began his inaugural lecture as professor of surgery in the University of Edinburgh on Oct. 10 with a graceful tribute to the late Sir David Wilkie, his predecessor. "Wherever he was," he said, "at home and abroad, he strove for all that was best in British surgery." Taking the evolution of surgical thought and surgical practice as his subject, Professor Learmonth said that surgery requires to be integrated with the general pattern of life; with the professions and the trades and so inescapably with economics and statesmanship. He traced its evolution from the renaissance of knowledge during the 13th century. The most important development at that period was the legalisation of dissection of the human body, for it placed in the hands of the medical profession the first accurate scientific procedure, allowing the correlation of the clinical features in the living with the pathological findings in the dead. Subsequent generations saw the development of purely anatomical surgery until the influence of John Hunter in the latter half of the 18th century stimulated investigation into disturbances of function rather than of architecture. The introduction of anæsthesia and antiseptic technique opened up fields hitherto thought to be outside the scope of surgery. The importance of the upset of function not only of the diseased part but also of the individual rapidly became apparent until the problem facing the modern surgeon became: Can the patient be restored to physiological function that is worth while? This entails a close study of each individual patient by clinical observation and by all the laboratory methods that have proved their value. The modern surgeon acquires knowledge of the variables in his cases by observation, experiment and reflection. The initial observation ground and the most important is the bedside. In surgical experiment, the best laboratory is again the bedside. Reflection requires leisure, but the tempo of life in the hospitals has kept pace with the outside world and there are few surgeons who would not eagerly welcome regular interludes during which their work could be scrutinised not only by themselves but by their fellow-workers. Any future reorganisation of medical effort ought to include the selection of a hierarchy willing and able to devote the necessary time to reflection. Individual effort in research is handicapped by the lack of contact with work in ancillary sciences. Collective activity is undoubtedly the best method of attacking impersonal problems.

The modern surgeon, Professor Learmonth went on, has two duties. First to the individual, to restore him to health, and secondly to the State, to see that the community is maintained at the highest standard of health, by the closest coöperation between the various services. "The tale of the achievements of surgery," he concluded, "is a notable one—a tale of which both the laity and surgeons may be rightly proud. Perhaps the laity will dwell with most satisfaction on the successes of the craft. The surgeon thinks of the problems as yet unsolved; of new problems which will confront him; of new approaches; of new outlooks; of the finished problems, thankfully; of the unfinished, more than a little wistfully."

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENT)

SOVIET MEDICINE AT THE WORLD'S FAIR

ALREADY two international congresses, those on microbiology and cancer, have been seriously crippled by the European War. Most of the English, French and German delegates were recalled at the last moment. One of the papers that was to have been read at the cancer congress is said to have gone down with the *Athenia*. But the Soviet delegate, Dr. A. D. Ochkin, not only attended the cancer congress but later gave an address on the progress of Russian medicine under 22 years of Soviet rule in the magnificent Soviet pavilion at the World's Fair. Although the meeting was held on the day following Russia's invasion of Poland no political tension was in evidence.

Dr. Ochkin said that the status of the Soviet doctor is a high one. Many medical men, along with other scientists, have been elected to the Supreme Soviets of the U.S.S.R. and of the autonomous republics. Young physicians working in the countryside are given a three months' assignment every third year for refresher courses. During this assignment they receive both their regular pay and special expenses. The medical corps of the Soviet Union is now more than 80 per cent. of direct Soviet origin; that is, this proportion have received their medical training during the Soviet epoch. Tuition in Soviet medical schools is free, and 90 per cent. of the medical students receive stipends during their studies. On graduation each student has a personal consultation with members of the Commissariat of Education and on the basis of this consultation the specific branch of medicine and locality in which the young doctor will begin his practice are decided. Medical education requires 5 years of university training following a 10-year course

in the public schools. After graduation the physician must practise for 3 years under supervision before he is allowed to practise independently. The Soviet Union now has 72 independent medical institutes with a graduating body of 100,000. A position is immediately found for every graduate by the government.

In reply to a question as to whether there was not a great deal of malingering when medical care is provided to all without charge, Dr. Oehkin replied that this is controlled by public opinion. Any instance of malingering is posted on the bulletin board at the factory and in consequence such instances are rare.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen in the half-yearly index

FROM A POITRINAIRE

III

FROM nurses, by a process which in our Pelman days was called concatenation, to doctors. The poor medicine-man has already been so much discussed and dissected and examined macroscopically and microscopically in these columns that there can be little fresh to say about him. But I cannot recollect having read anything by my fellow-scribblers, or even by the omniscient Osler, about the doctor as patient. Despite his poor reputation in this rôle, I think the doctor-patient has been unfairly maligned; if at times he is a bit difficult to handle, that is due to his training and not because of any general perversity in the breed. It is certain that he enjoys being nursed as much as the next man and the story of the placard at the end of his bed "Too ill to be nursed today" is, I am sure, apocryphal. What are his difficulties? Lack of faith might be thought a serious obstacle to his progress; but when one is ill, the emotions tend to get the upper-hand of reason and I for one became readily gullible about the efficacy of drugs and remedies which I should ordinarily have despised. Perhaps I can best illustrate the medical patient's troubles by cataloguing some of my own reactions.

* * *

Mental worry.—Nothing could be truer for the doctor-patient than the axiom "a little knowledge is a dangerous thing." With the emotions in the ascendant and the imagination running riot, all the dreaded complications and one-in-a-million chances are paraded in the mind when anything untoward happens. When an A.-P. was mooted and attempted upon me, I kept thinking of pleural shock and air-embolism, and when an intercostal neuralgia developed on my sound side, only a negative X-ray plate would convince me that it wasn't pleurisy; a bout of fever shortly after I arrived at the sanatorium had to me all the early features of typhoid fever—epistaxis, slow pulse, stair-case temperature, constipation—so that I insisted on a complete bacteriological examination, to the secret amusement (as I learned later) of the medical staff. Alas! the laboratory, as labs have a habit of doing, failed to confirm my diagnosis. Such a state of mind needs constantly to be reassured and I believe that frank explanations by the attendant physician of the doctor-patient's illness and progress, and fears allayed about the risk of possible complications would greatly relieve his anxiety. But he must not be molly-coddled, for then he begins to think that his is a very special case.

Physical pain.—To bear or not to bear? That was the question which worried me after each stage of the thoracoplasty. You can imagine the agonies of a fit of coughing when ribs are cut and, begging the surgeon's pardon, chest-muscles mangled (though I am for ever grateful to the physiologist who taught me that a tight pinch on the nostrils will abort an impending sneeze!). The resident staff invited the free use of sedatives whereas I, perhaps with the idea of stoic suffering but also, I think, with an instinct that pain tolerated meant a more rapid recovery, kept holding off as much as possible. Will some wise physician or pharmacologist tell us which was right? Pain is certainly suffered differently by different people, and by and large I'd say that the nearer the soil or the less civilised the patient, the better he tolerates pain. Think, for example, of the cowlike fashion in which the peasant of any country bears and produces her young and compare that with the pathological progress which child-bearing nowadays is to so many of our middle- and upper-class women. Luckily, acute physical pain does not linger long in the mind; the nightmarish sufferings of a few months ago are now but the vaguest memory. But, unluckily, the perfect analgesic is still hard to come by despite the infinite variety of barbiturates and opiates; morphine and its congeners made me sick, veganin and aspirin made me sweat like a horse, veronal gave me bad dreams and only nepenthe and allonal gave a modicum of peaceful relief.

Anæsthesia.—My knowledge of modern anæsthesia is very rudimentary, and when I heard from other patients that my thoracoplasty would be done under a local, I was rather sceptical and not a little afraid. But true it was, and apart from the preliminary needling to block the nerves, there was little discomfort; only the actual cracking of the ribs made me hold hard to the proffered hand of the anæsthetist. Despite the odd feeling of lying on the table, feeling the weight of periosteal elevator (I believe the surgeon calls it a rugine) and hearing the click of artery-forceps, the hiss of electric cautery and the occasional whisperings, I finished with a distinct preference for local over general anæsthesia, my personal experience of the latter being limited to chloroform and ether. With a local, the immediate after-effects of the anæsthetic are minimised and there is none of that persistent nausea at their smells which chloroform and ether leave behind. Besides, the use of local anæsthesia has, I am told, resulted in a greatly lessened risk of spread of the tuberculous infection during and immediately after the various stages of the thoracoplasty. It is all very wonderful to the uninitiated; as the 55-year-old Devonian who was my ward-mate said, "If I go back to C—— and tell the natives I've had bits of all my ribs cut out without being put to sleep, they'll call me a blinking liar."

I must not forget to pay my tribute to the surgeon. Chest surgery has made enormous strides in the past 10 years and the experience and manipulative skill of the specialist is now such that thoracoplasty and pneumonectomy are being undertaken with possibly no more risk to the patient than cholecystectomy or gastro-enterostomy. Unfortunately, the advances have been confined to a few centres so that many patients are being deprived of their benefits; for example,

there is not, I suppose, in the south-west of Scotland, with a population of two million odd, a surgeon who has done a couple of thoracoplasties. Such conservatism is unforgiveable.

Visitors.—Visitors to the sick may be divided into those who talk and go, and those who don't and stay. The understanding visitor realises what an effort it is for the patient to initiate and keep up a flow of conversation for an hour or more; consequently he himself does most of the talking for half an hour and then says good-bye. It is always wise to leave at a time when the patient seems to want you to stay a little longer. Ordinarily, the less well-known visitor and the visitor of opposite sex put the greater strain upon the patient so that, when he is really ill, admission to the sick-room should be limited to near relatives and intimate friends. Talking shop should be as much as possible avoided.

The patient's attitude to his family is always rather droll. Feeling that a mask of cheerfulness is no longer required and unconsciously craving for sympathy, he becomes a doleful creature, exaggerates his little aches and pains, and indulges in a general grouse. I suppose it does good thus to let off steam and to give way to the emotions, but it must be rather trying to the wife or mother; it irritates me still to recall the sulky and boorish manner with which a spoiled youth of nineteen used to greet and treat his parents. On the whole, however, I'd say with the historians of "1066" that visiting is a good thing. Indeed, one of my pleasantest memories is the many acts of kindness which came to me in those sick days, often from quite unexpected sources.

* * *

It is tempting, but would be romancing, to tell of the change in mental outlook, the sobering influence, the purifying effect which a serious illness produces or induces in the sufferer. I fear there has been little change in me unless it is a physical one; and I shall not weary you with the tale of atrophied muscles and flat feet or of the slow and painful business of their rehabilitation. The student of human nature will, however, notice one mental change in the sanatorium patient. He arrives a depressed and moody individual, resentful at the nasty knock the fates have dealt him and with that lingering feeling of fear and shame at having a "touch of trouble on his lungs." Gradually the depression lifts; this isn't such a bad place after all and the other fellows seem cheery enough. Besides, the county council is paying for his keep, his employers have been pretty decent about his pay and his job (the majority of them are!) and he is away from the petty worries of the home. He becomes more companionable; he is getting up now and the A.-P. is working fine. He takes his part in the life of the community, everyone calls him by his Christian name and soon he is as lively as a cricket; sometimes, sister will tell you, a bit too lively. It is only when he leaves this sheltered existence and again enters the hurly-burly of the outside world that things don't look so rosy and troubles crowd around him; but of that more anon.

PUBLIC HEALTH

Poliomyelitis in Essex

LAST year poliomyelitis appeared in epidemic form in many different parts of England and Wales. The region where this happened first was the county of Essex, and particularly the urban districts of Braintree and Halstead. An instructive account of the sequence of events in his county, and the steps taken to meet them, is given by Dr. W. A. Bullough in his annual report as medical officer of health.

During the first six months only the customary sporadic cases of poliomyelitis had been notified, numbering but 7 in all; but in the third quarter of the year there were 113 cases, and in the fourth quarter 61. The age-distribution in the epidemic period shows the usual preponderance of cases in the first ten years of life, but in the rural areas the incidence fell more hardly than in the urban upon the adolescent and young adult. Males were more often attacked than females—101 cases to 73—and the total fatality-rate was approximately 10 per cent. There was one family in which 4 cases were reported.

The outbreak naturally caused a good deal of public alarm and some dislocation of business in connexion with shopping, cinemas, swimming-pools and public meetings. Concerted action by the numerous health and education authorities concerned was achieved, but Dr. Bullough emphasises the need to improve on such a situation, "as it should not depend upon the personal factor of hospital boards, officials and others to ensure coöperation in establishing the best possible means of dealing with an epidemic of this kind." Unless one authority is made responsible for all hospital administration he would like to see the local M.O.H. medical superintendent of an isolation hospital in his area, or at least closely associated with its administration. With such a disease as poliomyelitis the services of a consultant physician should, he adds, be made available to visit homes and diagnose doubtful cases. In this outbreak Dr. F. E. Camps, the county consultant physician and pathologist, gave much help.

At an early stage it was argued by many people that the seriousness of the disease and its sequelæ should be minimised to prevent undue alarm. Dr. Bullough did not accept this view, believing that the withholding of information is likely rather to increase suspicion and alarm. It might well be pointed out, however, that even in epidemic periods the chance of an individual child contracting the disease is small, though this should not lessen the importance of laying stress on the need to avoid crowded assemblies, especially of young children. The advisability of school closure, to which we referred in an annotation a fortnight ago, is still debatable. Dr. Camps takes the view that poliomyelitis must not be placed in the same category as the common infectious diseases of childhood and that in its presence closure is desirable, together with strict instructions that children must be kept under supervision in their own homes—a counsel of perfection, perhaps, except among the well-to-do. He suggests that at the beginning of each summer letters should be sent to general practitioners and district nurses outlining the diagnostic features of the disease and the facilities available for assistance and treatment. In this way the overlooking of early cases might be avoided and immediate treatment and control more readily achieved.

RELIEF FOR POLISH REFUGEES.—Dr. R. W. B. Ellis left London on Oct. 12 for Rumania as one of a delegation from the Friends Service Council to inquire into the possibilities of doing relief work among Polish refugees. Dr. Ellis has already done similar work in Spain.

LETTERS TO THE EDITOR

BLOOD-COLLECTION TECHNIQUE

SIR,—The booklet recently circulated by the Medical Research Council describing blood-transfusion methods contains a section on the adaptation of certain apparatus to the vacuum method of blood-collection described by us in THE LANCET, 1939, **1**, 388. The advice given in this section is unsatisfactory and, if followed, will lead to so many failures that its circulation is regrettable. The chief mistakes are as follows:—

(1) *Type of tubing to be used for blood collection.*—It is necessary for smooth working that pressure tubing should be used. If the tubing distributed by the M.R.C. (No. 8, 3/16-in. internal bore) is used, as they suggest, it will collapse under the influence of the vacuum, and the flow of blood will be impeded. A 6-in. length of tubing is also too short for convenience; about 9 in. should be used.

(2) *Type of collecting needle.*—The 15/10 needle has great advantages over the 24/10 size recommended by the M.R.C. In the first place it simplifies venepuncture, which is an important consideration when blood has to be collected by workers with little experience from donors who are not specially selected for the large size of their veins. The smaller needle will fill the bottle just as efficiently as the larger one, which is, in fact, more likely to be obstructed by collapse of the vein on to its orifice. The 15/10 needle has the further advantages of lower cost and uniformity with the needles recommended by the M.R.C. for the administration of blood.

(3) *Preliminary filling of the tube with citrate.*—We have now performed several hundred collections with dry-sterilised apparatus as originally described and have never encountered any difficulty due to clotting of blood in the tube. We do not therefore see any reason for this measure, and we disapprove of it because it increases the risk of contamination which our method was designed to minimise and has almost succeeded in eliminating. We have cultured seventy bottles of preserved blood collected at this hospital during the early days of the war, in some cases by junior officers recently introduced to the technique. After removal from the refrigerator these bottles were incubated for twenty-four hours before the cultures were made, and they have all been found to be sterile. This desirable standard of sterility will not be maintained if unnecessary manipulations are introduced.

We are, Sir, yours faithfully,

C. R. BOLAND,
N. S. CRAIG,
A. L. JACOBS.

Mile End Hospital, E.1, Oct. 9.

FEVER BEDS IN WAR

SIR,—It is stated in the annual report of the Ministry of Health that, in England and Wales, 37,500 beds are reserved for the isolation and treatment of infectious disease. Although county schemes have facilitated the establishment of isolation hospitals of sufficient size to constitute efficient and economical self-contained units there are still large numbers of small fever hospitals; thus 74 district councils provide 1875 beds in their own fever hospitals (average 25 beds), and 812 grouped in 181 areas provide 9902 beds (average 55). Only in 43 districts requiring 260 beds have arrangements been made for cases to be admitted to the relatively large fever hospitals of adjacent county boroughs.

Accommodation having been provided to ensure a sufficiency of beds in epidemic periods, it follows that small isolation hospitals are often empty and the bigger hospitals have commonly a large number of unoccupied beds. The number of vacant beds has in recent years been increased in towns in which, with none but beneficial results, the scarlet-fever admissions have been reduced by a half, no case being admitted if a separate room can be provided for the patient, or the patient and mother. So it is that generally there is a large excess and a larger potential excess of beds in our fever hospitals.

Considering that in the near future our hospital accommodation may be taxed to capacity and patients may have to be nursed in overcrowded conditions would it not be well to make use, in part at least, of unoccupied fever beds and to see to it that scarlet-fever patients are only removed to hospital when such removal is necessary? This could be done by concentrating fever work as far as possible in the large well-equipped and well-staffed fever hospitals and using the smaller fever hospitals for general work; the country fever hospital would be ideal for convalescents. Such a procedure might well put 10,000 additional beds at our disposal.

I trust that this matter will have serious consideration now, rather than later when our time may be fully occupied in other directions.

I am, Sir, yours faithfully,

DUNCAN FORBES,
lately Medical Officer of Health for the County Borough of Brighton.

Oct. 16.

THE HOSPITAL SERVICES

SIR,—Correspondence in your columns and other evidence point to a wide-spread and, I submit, justified dissatisfaction with the present arrangements of the Emergency Medical Service regarding the visiting staffs of the voluntary hospitals in London. At some date between the end of June and the end of August it would seem that the Ministry reversed their previous resolution to maintain the voluntary system at the teaching hospitals and embarked upon the scheme of full-time service for all members of the staffs, both senior and junior. In his answer to a question put by me yesterday in Parliament, the Minister of Health declared that "recruitment to the Emergency Medical Service is on a voluntary basis" and that "salaries and conditions for this service were fixed in consultation with representatives of the medical profession."

With regard to the first statement that "recruitment is voluntary" it may be true in the letter but is not true in the spirit, and in certain instances within my own knowledge sector officers have taken up the position that members of the visiting staff of a teaching hospital who refused to undertake the Emergency Medical Service thereby ceased to be members of the staff of the hospital concerned. With regard to the second contention, I think I voice the opinion of many of my colleagues that the "salaries and conditions" fixed for consultants under the earlier scheme of full-time service, and the later concession of part-time, demonstrated that these "representatives of the medical profession" cited by the Minister were very unrepresentative of the consultant section of that profession.

The chaos immediately supervening on the withdrawal from London of practically all the members of the visiting staffs of the great hospitals, brought about by full-time enrolment, and the grievous injury inflicted upon the civil population by the sudden

relinquishment of nearly all responsibility of London hospitals for treating the civilian sick, very soon compelled a radical alteration in the earlier plan. After some tentative and completely unsuccessful experiments a second scheme was announced in a circular from the Ministry of Health dated Sept. 18, which apparently is now to be regarded as the official and operative proposition. It is this scheme which is clearly indicated in your leading article of Sept. 23; the complacence with which you seemed to accept it in that pronouncement is not, I think, widely shared by those members of the profession whom it chiefly concerns, namely the visiting staffs of the voluntary hospitals. It was, of course, designed to meet the most serious difficulties which had become apparent in the operation of the earlier scheme, chief amongst which was the abolition of private practice and the withdrawal from the voluntary hospitals of the staffs which had been responsible for the treatment of civilian patients.

The scheme may be thus briefly summarised, The Minister is prepared to transfer "*some* (the italics are his) of the medical personnel who have already been called up from whole-time to part-time in order that they may be free to engage in private practice." This concession concerns only the visiting staff, and the Minister reserves the right to re-impose full-time service at his discretion at any moment upon persons so released. The terms announced are that any officer accepting part-time service is "to make his services available to the State, if required, for the equivalent of four days in every week, the remainder of the time being at his own disposal." He is to receive, for doing four-sevenths of the work, only one-third of the pay accorded to full-time service, and he is to be deprived of allowances for billeting, travelling expenses, and extra petrol available to the full-time officer. It is not surprising that these terms have been regarded as inequitable, a view which was clearly manifested at a special meeting of the comitia of the Royal College of Physicians held last Thursday to discuss the position of fellows serving in the Emergency Medical Service.

In response to urgent representations made to me by certain of my parliamentary medical constituents I obtained an interview with the Minister of Health last Wednesday and upon my instance he then expressed himself willing to add a *third* category of service to those at present offered, namely (i) full-time service, (ii) part-time, on the conditions just cited. The Minister was good enough to embody the suggestions made in our conversation in a letter to me, which I received on the morning of October 12, and which he authorised me to read at the meeting of the comitia that afternoon. The concession now offered is enrolment of "certain senior men of the standing of fellows not in the emergency service who would like to put down their names with the Minister as willing to give practically unlimited service if a major emergency arises but are desirous of remaining without obligation and without remuneration till such time as that emergency occurs."

This, I submit, in effect, restores the voluntary system of service which was entirely successful in the last war, and I have reason to think would be acceptable to a large number of the members of the visiting staffs of hospitals in London. I believe that there would be no difficulty in transferring members "of the standing of fellows" at present in the Emergency Medical Service to the new category if they so wished. The importance to my mind of insisting *now* upon some measure of voluntary service is urgent, in view of the changes in the medical profession which may follow upon the termination of the war. Already there has been an ominous indication of what some members of the profession expect, and apparently hope, will be the result of the emergency scheme as at present operated. I quote from a recent editorial pronouncement in a medical journal:

"The organisation of this scheme will have a bearing on the future of medicine which will be of the utmost importance. For the first time there is Government control of those most stout and gallant-hearted last-ditchers of the medical profession, the consultant and specialist groups. Whereas the National Health Insurance scheme started by attracting the general practitioner, what may possibly prove to be the genesis of a State Medical Service has been precipitated by war, and its initial step has been the enrolment of the consultant groups. The difficulties attending such an enrolment could only have been solved so quickly during a national crisis, and the advent of the emergency has probably put medical politics forward ten years. A great struggle is still in store, for the voluntary system, well-suited to the national character, and with many advantages as compared to a rigid State service, will have many adherents."

How far this consummation may be successfully resisted will, I think, depend upon the measure of acceptance given to the new third category, and it is in the hope that some indication will be given in your columns of its prospects of success that I ask your hospitality for this letter.

I am, Sir, yours faithfully,

House of Commons, Oct. 13. E. GRAHAM-LITTLE.

FREUD'S INFLUENCE

SIR,—Though most of your readers will not fail to note the antisemitic complex responsible for the letter entitled Freud and Sex in your issue of October 14, I feel that it should not pass unanswered. The example of Nazi Germany is before us to demonstrate the ease with which ideas of being persecuted (be it by Jews, Catholics or Freemasons) can spread rapidly among the masses through the influence of suggestion and constant iteration.

To be brief, I would only make two points:

(1) Wars between tribes, races or nations were numerous and frequent before Freud was born, and indeed long before the Jews existed.

(2) Dictatorships of one kind or another are recorded in the histories of Babylonia and Egypt. They are not an invention of the Jews.

It is no doubt convenient to blame one single factor for all the evils of this world, and this appeals to lazy minds as it helps to simplify problems which are in reality complicated and require great effort of thought to unravel. Life becomes so easy if one can blame the Jews for the existence of wars, bolshevism, capitalism, socialism, unemployment, prostitution, a declining birth-rate, venereal disease and so forth, as taught by the Nazi ideology, but I am confident that the vast majority of your readers will think otherwise.

I am, Sir, yours faithfully,

I. ATKIN.

Park Prewett Mental Hospital, Basingstoke, Hants, Oct. 13.

SIR,—I agree with Mr. Rugg-Gunn that it is sometimes right not entirely to hold to the old maxim, *De mortuis nil nisi bonum*, especially in regard to outstanding lights of progress such as the late Sigmund Freud. Though at first there is a real danger that something against the hero may be remembered more than his great achievements, such

errors are always rectified subsequently when the perspective becomes clearer.

Charcot, whom I myself remember, offers a striking example of this. By his zealous work and genius for clinical research and teaching he attracted students and doctors from all parts of the world to the Salpêtrière in Paris. He inspired his internes and visitors with his own spirit. His pupils helped him in searching the medical literature of all countries, and he always endeavoured to give credit for every little landmark in neurological progress to the author who had first, or best, described a disease, a symptom or one of the (now innumerable) "syndromes." The push that he thus gave to the progress of the study of neurology was almost incredible, and yet, soon after his death, there were some who thought of him as the physician who had "cultivated" that specially dramatic type of neurotic attack amongst his female patients known as the *grande hystérie* of the Salpêtrière. Worse still, everyone knew that Léon Daudet, who possessed considerable inside knowledge and had quarrelled with Charcot's son, had with too satirical vigour held up the Salpêtrière school to ridicule, and had even made it appear infamous, in "Les Morticoles." All that has now been rectified and balanced, and Charcot's position will remain in medical history unchallenged, except by those few who refuse to look up the facts. Even with William Osler, it was not so long ago that American journalists spoke of him as the physician who (in 1905) advocated a painless death by chloroform for all men soon after reaching 60 years of age.

Surely Freud should be remembered chiefly as the man who, in the vast castle of knowledge, took the giant's part in helping to break down the barriers leading into the galleries and vaults of the "subconscious." It is obvious that these galleries and vaults were rather dark, and in the dim light some of the explorers fancied they could see much that was not really there. Since then these chambers have been illumined with artificial light and, for the sake of visitors, Freud and especially his English and American followers have adorned the walls with pictures and diagrams illustrating rather dismal subjects, which they had (or thought they had) discovered in some of the deepest of the vaults; these subjects extended from the much talked of "Œdipus complex" to the complicated idea of "patricidal anal sadism." Inhibitions, complexes, obsessions have doubtless been attributed to alleged infantile traumatic experiences in cases in which the latter existed only in the patient's imagination—i.e., as the result of subjection to the psycho-analytical examination—or had really existed but had no causal relation to the present symptoms.

I am more sceptical than Mr. Rugg-Gunn of much permanent harm having been produced by the Freudian psycho-analysts, but a few years ago scientific lecturers on the wireless seemed to have accepted some of the more dubious Freudian doctrines as having been founded on genuine scientific deductions. I wonder whether they had examined the evidence adduced in writings by London followers of Freud to prove the correctness of many of their psycho-analytical diagnoses.

I do not see how Freud can be held responsible directly or indirectly for the present prevalence in England of certain *minor* Oriental evils, under which I would include dyed finger (and toe) nails, artificially altered eyebrows, and the abundant use of lipstick and face-painting—which latter two often produce an appearance reminding me of an embalmed person I was once shown inhabiting the library of the house that during life he had owned. I do not think, however, that our Phœnician Jezebels should be cast out from an upper window at the approach of Jehus or at the instigation of Puritan prophets; but perhaps Englishmen might somewhat less encourage the employment in young women of such artificial supposed "improvements" and "charms."

Anyhow, it will be on solid ground that Freud's pioneer work will be immortalised in medical and psychological history.

I am, Sir, yours faithfully,

Harley Street, W.1, Oct. 15. F. PARKES WEBER.

SIR,—It is scarcely for a humble psychiatrist, who is not a follower of the Freudian school, to defend the memory of the greatest of all psychologists. But would Mr. Rugg-Gunn expound for us the Jewish ideological basis of Nazism?

I am, Sir, yours faithfully,

C. J. C. EARL.

Caterham Mental Hospital, Surrey, Oct. 15.

*** We regret that space is not available for other communications in reply to Mr. Rugg-Gunn. Dr. ALAN MCGLASHAN responded in verse of which three stanzas follow.—ED. L.

ODE TO MR. RUGG-GUNN

(With apologies to The Skylark)

Hail to thee, blithe Spirit!
In this time of grief
Thy transcendent merit
Is to bring relief
To our sad hearts by one big laugh, however brief.

Higher still and higher
From all sense it swings,
Spurning in its ire
Checks that Reason brings—
Thy, so to speak, *Sigmundoscopic* View of Things.

* * *

What thou art one knows not;
What is like thee, pray?
Such a Theory rose not
In mere mortal clay:
O urge thy Muse yet higher! Blame the I.R.A.

BACTERIOLOGY OF RHEUMATISM

SIR,—I have read Dr. Collis's valuable paper on this subject in THE LANCET (Oct. 14) and am perhaps rather glad that I am still alive to thank him for his kind references to Dr. Paine and my work of ancient date. Yet I must make some slight demur. Needless to write that in 40 years I have been amused and sometimes surprised at the disparagement, hostile criticism and even ignorant statements so often repeated, because I am quite aware that when both those Englishman are dead, who revolutionised in this country the study of rheumatism, some honest medical historian, picking up "Researches on Rheumatism," will point out this fact to his countrymen.

It has long been recognised in the Dominions, America and on the Continent, for of this I have written proofs. I demur because Dr. Collis writes we claimed the "specific germ." What we did write and I repeated for the *n*th time, was to this effect. We thought "juvenile" rheumatism was a specific disease (in so far as any children's disease is specific) and that if the diplococcus we described and found was the only "germ" producing it this had probably some special features. I have always left to others to define a "specific" germ. Again he writes that what we produced by experiment was not "rheumatic" but "infective." I was always under the impression we were attempting to show that this rheumatism was

infective. To prove rheumatism was rheumatic seems to me would have been a waste of breath.

These are but little points answered countless times. What is the great demur is his statement that our "central hypothesis was disproved." If so we worked in vain. I venture to write that our central hypothesis, that acute rheumatism was on evidence infective and therefore, if possible, to be prevented, holds good today, and is recognised practically all over the world. It is the details such as the exact processes at work in the infection, the advancement of bacteriology and so forth which have altered and which doubtless have thrown more light on a primitive effort. Whether they have given a better explanation of all the facts of the disease than that we gave in the last chapter of "Researches on Rheumatism" is not for me to say. This is certain: if our central hypothesis was wrong laboratory investigations will not put it right, for it was based on clinical, pathological, bacteriological and experimental investigations.

It is good that Dr. Collis has continued his researches on this vast problem, for obviously no two men could solve it or be free from some error in reasoning. We gave up because after 13 years what we wrote was not accepted, and it was for others to show the way. It is very fortunate that our original specimens, lantern slides, drawings, &c., are located not only in England but in the great Dominions, for, if I live, I may read that our work was imaginary and the perfect hoax.

I am, Sir, yours faithfully,

Bath, Oct. 16. F. JOHN POYNTON.

PLASMA TRANSFUSION

SIR,—With reference to the annotation in the current issue of THE LANCET on the subject of plasma transfusion in the treatment of shock, which directs attention to a communication by Dr. J. Elliott and Dr. N. Nessett, this subject has not been overlooked by the Army Blood Transfusion Service. Extensive experimental investigation is in progress on the subject. When the result of this work is available it will be possible to arrive at a decision as to whether the supernatant plasma of old stored blood can be utilised in this connexion.

I am, Sir, yours faithfully,

H. MARRIAN PERRY,
Director of Pathology.

Millbank, S.W., Oct. 16.

MEDICAL LIBRARIES IN WAR-TIME

SIR,—Since your leading article of September 23 appeared, the bodies controlling the chief medical libraries in London have had opportunity to decide their policy at least for the immediate future. The following statement of the present position may therefore be of interest:—

British Medical Association.—The library is open 9–5, Saturdays 9–1 and carrying on as usual.

London School of Hygiene and Tropical Medicine.—The library is open 10–5, Saturdays 10–noon. The board of management offers the profession as full a service as possible. The *Bureau of Hygiene and Tropical Diseases*, which acts in close coöperation with this library, is continuing from a temporary address at Cambridge its normal work of promulgating information to the medical officer overseas and to the profession in this country.

Royal College of Surgeons of England.—The library is open 10–6, Saturdays 10–1 (possible earlier closing on winter evenings). Readers admitted on introduction of F.R.C.S. or M.R.C.S.

Royal Society of Medicine.—The library is open 9–5, Saturdays included. Owing to lighting restrictions it is not practicable at present to keep open in the evenings, otherwise the service is as usual.

This shows that the curtailments which you criticised in September were temporary precautions due to the uncertain conditions when war began, and that the general tenor of your editorial is approved in practice, in London at least. Your wider suggestion for the fullest coöperation of medical libraries under one bureau might be made desirable by the conditions of the war, though it would entail much difficult adjustment. But in all circumstances it is essential, as you say, that medical libraries should be adequately and efficiently staffed.

As to foreign books and periodicals, we hope to provide the current literature from all countries, as in peace-time and during the last war, and our agents are seeking licence from the Government to import German publications.

In conclusion we should like to add that the corporations responsible for the libraries we represent wish them to give the profession their best services in war as in peace.

We are, Sir, yours faithfully,

CYRIL C. BARNARD,
Librarian, London School of Hygiene and Tropical Medicine;
G. F. HOME,
Librarian, Royal Society of Medicine;
W. R. LEFANU,
Librarian, Royal College of Surgeons of England;
R. L. SHEPPARD,
Secretary, Bureau of Hygiene and Tropical Diseases;
T. J. SHIELDS,
Librarian, British Medical Association.

Oct. 14.

HÆMATURIA AND M. & B. 693

SIR,—Cases of hæmaturia during treatment with M. & B. 693 have been reported by H. Southworth and C. Cooke in America (*J. Amer. med. Ass.* 1939, **112**, 1820) and by T. C. Backhouse of New Guinea in your issue of Sept. 30 (p. 736). It is notable that no cases have so far been reported in England; two patients suffering from this condition have, however, been mentioned by Römcke and Vogt of Norway in your issue of Oct. 7 (p. 778). It appears likely that this symptom is more common in relatively warm climates, where the patients will excrete a small quantity of concentrated urine, and where the acetyl derivative of M. & B. 693 is therefore more likely to be precipitated in the urinary tract. This precipitation has been shown to be the cause of the hæmaturia.

I am, Sir, yours faithfully,

G. A. H. BUTTLE.

Army Blood Supply Depôt, Southmead Hospital, Bristol, Oct. 14.

POSITION OF MEDICAL STUDENTS

SIR,—We feel that many of your readers may not be aware of the effect of the Emergency Medical Service on medical education. Although we fully realise the necessity for this scheme, and appreciate the efficiency with which it is organised, we are concerned with the suspension of medical education which it has entailed. Under this scheme, students in their clinical years have been distributed throughout the sectors controlled by their hospitals, in small groups, working with blood-transfusion units and as surgical dressers. Although in some hospitals the staff have instituted teaching which is at present unrecognised, this is not by any means universal, and adequate clinical material is rare. Since the need for doctors is greater than ever in war-time, we feel uneasy at this arrest of medical education. It has now lasted for six weeks, and as yet we have heard of

no plan for the organised continuation of our studies. We are looking forward to such a plan, and in anticipation of it we should like to put forward the following proposals:

1. *Preclinical students.* In order to prevent a shortage at a later date, the number entering on their preclinical training should not be reduced either by compulsory military service or through economic hardship created by war conditions. If possible, this number should be increased.

2. *Teaching.* The standard of education should suffer as little as possible through war conditions. Recognised teaching centres should be distributed throughout the sectors, available for all students working in neighbouring casualty-clearing stations. Meanwhile, vital clinical appointments could be ensured by rotation of students to the hospitals where there is appropriate clinical material. But while each student should have his emergency station in the E.M.S., the short periods when education is held up should not count as part of his course.

3. *Economic conditions.* Students should not be allowed to give up their training through economic hardship brought about by their redistribution. Although in some medical schools the number of grants and scholarships has been increased, and we should welcome the extension of this, we suggest that hardship committees be set up to provide for those students who cannot afford to continue their studies. These committees should include some responsible students with first-hand knowledge of students' difficulties.

4. *Examinations.* Now, when the need for well qualified doctors is increased, the standard should not be lowered. Already the course has been shortened and pathology as a subject has been omitted from the conjoint examination. This, in our view, is one of the most important subjects for an understanding of medicine, and we are alarmed at its omission.

If it is necessary at the moment to have an immediate reserve of doctors in excess of the peace-time numbers, it may be necessary to shorten temporarily the period of clinical training. But it is also of vital importance that those who are qualified should be justifiably qualified, and that no lowering of the peace-time standards of examination should occur. Rather should there be an intensification of medical training to counteract the necessary shortening of the clinical period. This reserve of men may later be called upon, but at the moment they should replace as many students as possible in the casualty-clearing stations, so that the latter could continue their training under better conditions.

Since the medical schools are now scattered over large areas, organisation such as that suggested above would, we consider, be more effectively carried out by some central body, such as the University of London, as opposed to the isolated efforts of individual medical schools. Though we fully realise the magnitude of the problem to be solved, and the great efforts that are being made, it is to the advantage of both the general public and the medical profession that a solution should be found as rapidly as possible. The suggestions we have made are an attempt to assist those responsible in meeting this urgent situation.

We are, Sir, yours faithfully,

A GROUP OF LONDON MEDICAL STUDENTS.

London, W.C.1, Oct. 15.

Colonel Frederick Whalley, D.S.O., T.D., M.B., has been appointed honorary physician to the King in succession to Colonel H. T. Bates, who has retired. In civil life Colonel Whalley is anæsthetist to the Leeds General Infirmary.

. . . . IN ENGLAND—NOW

GRASS is growing apace from the sandbags guarding King's; one shoot measures fully 9 inches. It gives the sandbags a detestable air of permanence—that air of "duration" with which we became so familiar in 1914–18. It makes them look almost as though they had always been there—and truth to tell it is getting difficult—more difficult each day—to remember the time when they were not. And yet it is a bare six weeks since we rolled up, just where they are stacked in front of the hospital, chauffeur driven, to give our condescending nod to the patiently (sic) waiting house-surgeon. It is the swiftness and completeness of this change in existence, I suppose, which gives so erroneous an impression of longevity.

Sandbags! What a wealth of memories they already have for us. We will not easily forget how those students toiled, naked to the waist, in the hot days preceding the declaration of war. Their achievement in those three days is almost incredible—but the monument of sandbags is there to bear witness to it. Until the dignity of officialdom exerted itself, the top row was decorated with empty beer bottles. Not many of course, for we of King's are a sober lot. But the Watney (or perhaps the Bass) could have made play, had he known of it, with the idea of how his bottled calories had been converted into foot-sandbag-pounds of energy. I'm not sure that I did not prefer the bottles to the grass; it looks so forlorn. It belongs, too, to a nurses' garden, dug up to fill sandbags hurriedly; perhaps it is nostalgia which makes those dull green blades bend forward so piteously. They may possibly be emblematic of the graveyard in which the hopes of Harley Street and consulting practice lie buried—and buried ever deeper as the days pass by.

Is this medical service really the beginning of State medicine? Everyone is asking. Is it the end of the voluntary system? And if it is? What do we all think of it, those of us who have been born and nurtured in the voluntary hospital, and have given the best years from professional life, fully and with unspeakable pleasure, so that the voluntary system shall flourish? Our feelings must be well-nigh indefinable. But perhaps, a good thing, a desirable thing, if Harley Street and all that it stands for should die, is that medicine will be divested of most of its insincerities. No longer would high rentals and large commitments face the young, newly appointed honorary, who aspires to consulting practice. No longer will the idea prevail that larger and larger motor-cars and houses are necessary to give the impression to the world of success. Gone the particular cachet which Harley Street is said to confer, and gone will be the amazing welter of quackery from the qualified and unqualified who pay via a high rental for their Harley Street "degree." Gone will be the unjust competition of those foreign gentlemen with high-sounding names and indifferent experience. Gone, too, will be the pseudo-consultant who has the effrontery to charge his patients guineas, even though he does no work for charity. His correct fee, as an old colleague used to say, is 7/6—shillings not guineas. We ask for guineas so that we may afford, through our patients, to devote the greater part of the living day to our honorary commitments at charity hospitals. State medicine may put to flight all these things, for ever. Who will deny but that this would be on the credit side, and wholly desirable? Even apart from the establishment of State medicine, if the war lasts long enough, it is still possible that the Harley Street bogy will be chased out of existence. For shall we all, on our release, return there? Very few of us, I trow. If we accept, as everyone does, the principles of the treatment of paying patients in special pavilions attached to our hospitals, why not also see our paying outpatients there? Why not the private outpatent clinic? Not only is this logical, but it is wholly beneficial to patient and consultant alike.

But I have strayed too far from my sandbags. I am

reminded of them now, of the stubble of grass which grows from them, as I pensively stroke my upper lip. Strange things happen in war-time. One of our frivolities is a moustache competition, with the prize of a gilt moustache cup to the winner, the award to be made one month from the commencement of hirsutilities. What a complete change of mien it has given to some of us! And how revealing! Who would have suspected T. of being ginger, or W. of being brunette? Only sixteen days have passed, alas! It will be the one and only experiment for most of us. Our disrespect for our faces has spread even to our clothes—soft collars and flannel bags—which brings me back to sandbags and a one-time *Times* crossword.

"Sandbags perhaps?" was the clue; "beach pyjamas" the answer.

* * *

The dispersion has affected not only mothers and children, but also doctors and nurses. These have been spread from inlying institutions into the surrounding country. Visits I made to hospitals in the week before the petrol rationing showed how the "reception area" staffs had been influenced as well as those who had gone out. A vast institution twenty miles away which is usually devoted to the convalescence of London children had had decanted into it a mixed vintage of patients including children recovering from illnesses, accidents, and operations; and in one of them were working many doctors, interns and nurses who usually are on duty at the outpatient clinics attached to the school service. They were pleased to be back for a time in wards, brushing up their technique of this side of their profession. Another great institution, which has been empty for some months, was being reopened all at once. Usually it does so a few wards at a time, with the seasonable increase of illness. A skeleton staff starts with the first block and further staff is drafted down as each fresh block is ready for occupation. It i a different matter when two thousand beds are to be opened *statim*; especially when the arrival of a fleet of vehicles bearing hundreds of nurses coincides with an air-raid warning. The administration was for the moment staggered; and so were the nurses who had merely been told they were being transferred, and had expected to arrive at an institution fully equipped and in the full swing of work where, after an interview with the matron or her assistant, each would have been allotted a bedroom and appointed to a ward. However, after a few preliminary gasps, probationers tucked up their sleeves and went down on their knees to scrub the floors. Young doctors lugged hand-carts containing mattresses and other equipment round to the wards from the stores where they had been kept at an even temperature.

At yet another hospital the problem was different. Here an old institution was already in the process of enlargement when the emergency arose; and completion of new wards was being pushed forward at a rapid rate. Then there are those institutions where their work is in a state of transition. While carrying on with the treatment of infectious disease or mental disorder, a part has been converted for the treatment of the wounded. There is an air of quiet in such places that is absent from those that are opening or expanding. Yet again there are the general hospitals which always deal with accidents as well as the civilian sick. In these a readjustment of the allocation of beds is all that has been needed; a heavy work to those in administrative control, but not accompanied by the bustle that was seen in those which were opening or expanding.

As the result of what I saw that week I am tempted to point a moral and adorn the tale. It tests our adaptability, and finds out those that can turn a hand to many things from those only fitted to a groove. All should learn lessons from the dispersion; not only those who have been moved, but also those who have received as temporary colleagues others who in normal times do different work. I noticed three things. Those of us who work at big general hospitals do not know how to get patients well, but only how to put them on their way to it. At the first big hospital that I have mentioned, the difference between wards staffed by those who had long been dealing with convalescence and those staffed by others drafted down was very striking. The children in the former were further on the way to recovery than those in the latter. They were up, they were merry, they were playing together, they were friendly one with another. In the other wards the patients were not up, and when one asked the sister why, she answered, "Well! the doctor has not ordered it"; but when one asked the doctor, he replied, "Oh! I don't know. Yes, I suppose that child might get up now." And of those that were up, each was sitting solitary, motionless, silent and with a flat face. We doctors at the general hospitals do not appreciate how much there is to be done after we have written on the bed-board, "to get up." We do not even realise that the further guidance towards health is our responsibility. And how unobservant we are! I had been going weekly to this hospital for the last six years, and passing thence to a great teaching hospital, and yet I have never noticed this difference in technique. When I saw it in two wards side by side it hit me in the eye; but I am not sure that it had so struck any other. This unobservance is, I think, evidence of our want of adaptability. Another may be put in the words of a certain medical superintendent. "How few of our profession have what may be called the quartermaster's frame of mind." Surgeons especially seem deficient of this. They little know, they seldom realise, how much thought goes to the organisation of their operating theatre, how much there has been of trial and error, and many petty annoyances, and how wide a change may have to come from a minute alteration in their technique. They walk in taking it all for granted. Give a surgeon an empty room and his equipment in packing cases and he is powerless. His only reaction is to jump into his car and drive back to London. And yet to those who believe in technique what an opportunity it gives, one that may never come again, of overhauling it and casting out all that is useless and effete. And the third thing that struck me was how like the army it all is. Well, probably the principles of administration must always remain the same, just as do those of surgery or of war. It is only in their application that they seem to vary. The medical superintendent of a hospital of two thousand beds has a charge that is about the same as the command of an infantry brigadier. His deputy is his "G" branch staff-officer, while the matron represents the adjutant-general's department. The "Q" branch is divided between the steward and the engineer. But order comes out of chaos and the new organisation is ready.

* * *

Today I had to examine a man whose ship had been torpedoed by a U boat. He told me something of the story. The last of the boats to be lowered before the ship foundered—"it was a rowing boat, not a lifeboat"—had just one place left. "You'd better get in Smith and look sharp about it," said the captain to my patient, who had been peppered with shrapnel; the boat pulled away just in time. The captain and one or two others were drowned. "You see," said my patient, "it was a pretty choppy sea, and we all knew that unless some help came quickly there wasn't any chance of them being able to stay up very long. He died a brave death, did the captain."

The evacuation of schoolchildren produces serious thinking not only in adults. My eight-year-old son, staying in the country with his grandparents upon whom were billeted some evacuees, had experienced in his own person the ravages of a flea. "Wouldn't it be a good idea," he remarked dreamily, "if we sent a lot of fleas over to the German soldiers, and then just as they were going to shoot they'd have to stop and scratch themselves."

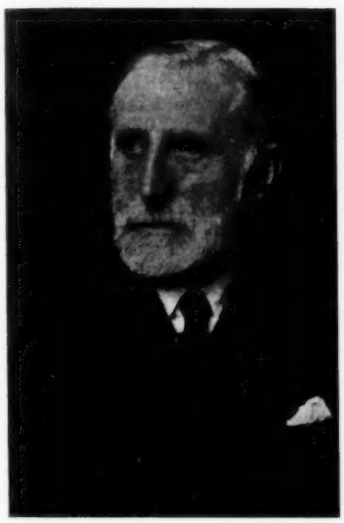
OBITUARY

GEORGE ALEXANDER SUTHERLAND

C.B.E., M.A. ABERD., M.D. EDIN., F.R.C.P.

Dr. Sutherland, who died on October 10 at Amersham in his 79th year, had retired from practice ten years ago. He had been in poor health since an attack of influenza last Christmas and the end came peacefully and painlessly.

George Alexander Sutherland was the third son of James Sutherland, D.D., of Aberdeen and took an arts degree there before going to Edinburgh where he qualified in 1886. After several months in Vienna he was resident in Edinburgh first at the infirmary and then at the maternity hospital, and then migrated to London where he was house-physician to the recently established Paddington Green children's hospital, where Lauder Brunton, Leslie Ogilvie, Sydney Phillips, Herringham, Watson Cheyne and Stanley Boyd were then on the staff. The enjoyment of his work there was enhanced by his friendship with Leonard Guthrie, his immediate senior, whose gifts were the counterpart of his own. This was only ended by Guthrie's sudden death in 1918. Sutherland's period of service at Paddington was broken by two voyages to Australia as surgeon on the *Orient*; on his return he became registrar, assistant physician and finally senior physician—an association only severed by his retirement. He was also physician to the Hampstead general hospital.



Elliott and Fry.

Sutherland's main medical interests, writes Dr. Reginald Miller, were entirely clinical and it was as a clinician that he excelled. His gift of observation was truly remarkable, and this, backed by great thoroughness and supported by a most sane judgment, carried him far in clinical work. He relished clinical problems and dearly loved debating them. Although keen for his own point of view he would canvass other opinions very readily, and he appreciated arguments presented against his own views. His attitude towards his junior colleagues and residents showed the essential generosity of his nature. He was ever ready with praise and encouragement, and the results of his experience and his powers of criticism were always at the disposal of those who approached him. In these ways he made an ideal senior colleague and chief. But he was a Scot and a bachelor, and there was in him a streak of shyness, and thus for many he was more easily appreciated through his medical interests than by other ways. From whatever angle, however, he was approached it took no time to recognise his kindliness and sincerity.

Sutherland's primary interest, as his writings testify, was in children's diseases; he published several pædiatric books and edited a work on diet. A fresh direction was given to his work through his contact with James Mackenzie when he came to London. Mackenzie had a high opinion of Sutherland's grasp of his work and its implications, appreciating the fact that his attitude was not one of blind acceptance of his teaching but implied a critical consideration of it in all its aspects. This new interest resulted in the publication of a book on the "Heart in Early Life," and in an invitation to deliver the Lumleian lectures. During the last war he did good medical work for the Air Force and well earned the C.B.E.

Of his personal qualities another colleague writes: "Sutherland was a good physician, painstaking and thorough, full of practical wisdom, and more sympathetic than the casual onlooker would have supposed. He was a keen controversialist, and thoroughly enjoyed the cut and thrust of informal discussion; he was at his best in a small coterie such as a clinical club. He was a keen golfer from his early Aberdeen days, thoroughly enjoying the game, and just as thoroughly the talk and chaff on a wet afternoon in the club house where his repartee was often in evidence. To crown all, he was a good and loyal friend, most highly appreciated by those who knew him best."

THOMAS MORRELL THOMAS

M.D., M.S. LOND., F.R.C.S.

Morrell Thomas was born in Cardiganshire in 1871, and after preliminary studies at Aberystwith College went on to Guy's, where he took honours in his M.B. in 1895 and passed his M.S. in the following year. After resident appointments at Guy's he joined his uncle, Dr. (later Sir) Garrod Thomas, in Newport, Mon., and soon got appointed to the staff of the local hospital now known as the Royal Gwent Hospital. For several years before his retirement he was senior surgeon of the Royal Gwent, but to the end of his days he was, and called himself, a general practitioner. It says much for the opinion of his fellow practitioners that in addition to a large general practice he had one of the best surgical practices in Monmouthshire. His wide experience gained from observing the final results of operations, combined with his high academic qualifications and sound surgical training, made his opinion unusually valuable. This combination of general and surgical practice left little or no time for other pursuits, but being sprung from country stock he knew much about the land and those who spend their life on it, and in his later days he developed a keen interest in antiques and archæology. He is survived by his wife and daughter and a son who is a medical student at Guy's.

JOHN DIXON COMRIE

Mr. Henry Wade writes: "A fair appreciation of Comrie can be formed from the portrait which hangs in his son's dining-room in Edinburgh. It reveals a tall, upright, stern and kindly man, able and reserved, suggesting the central figure in Luke Fildes' famous picture 'The Doctor.' On the wall of the same room there is a masterpiece by Fildes Watt of his mother, a handsome elderly lady whose house we younger medicals liked so much to visit. Comrie was older than most of us who were fellow residents with him at the Edinburgh Royal Infirmary, and his

appearance and manner conveyed a spirit of kindly, almost unobservant fatherly tolerance, a sort of 'boys will be boys' attitude to our actions and our opinions; we in turn called him 'the Kaiser,' because of his tall, upright, military figure and a moustache with the points turned up as an outcome of a visit to Germany, the postgraduate home of most of us at that time.

"Although a splendid teacher of students and an able physician, it was obvious that John Comrie's heart was more in the literary side of medicine than in clinical work. Fortunately early in his career the opportunity arose when he was appointed our first university lecturer in the history of medicine. His enthusiasm knew no bounds; at a period when with most of us the financial claims of the necessities of life had to come first, Comrie commissioned a distinguished artist to paint for him a picture of the temple of Æsculapius at Epidaurus, reconstructed as it was in the days of its busy practice, with physician, disciples and patients. This large canvas took up the greater part of one of the walls of his consulting room.

"After a life of public service, his fellow physicians two years ago chose him as vice-president of the Royal College of Physicians of Edinburgh, a position which is looked upon as training for the still higher post of president. But death has intervened. Those who knew Comrie will remember well the quiet voice when presiding in the chair, the humorous 'pawky' ruling that quietened the turbulent meeting, the twinkle in his eye with which the situation was discussed afterwards, and the kind word he had of everyone with evil thought of none."

HARVEY CUSHING

TWO FURTHER SURGICAL APPRECIATIONS

Mr. Geoffrey Jefferson writes: Harvey Cushing's was one of those vital personalities, rare in any profession or in any walk of life. The story of his long attachment to neurosurgery began soon after he went to Johns Hopkins, but it was not until he had worked in Bern that his publications became specialised. There is no doubt that Halsted exerted a profound influence upon him during the formative years. Halsted's insistence on the utmost care in the recording of every clinical and pathological fact, whether it might seem to be at the moment relevant or not, on the utmost gentleness in the handling of tissues and on the minimising of blood loss and shock met with an instantaneous and understanding response in the young Cushing. He modelled himself upon his master and transferred the Halsted technique to a branch of surgery to which it had not hitherto been applied. He took up this speciality contrary to Halstead's advice. Halsted felt that cases of nervous dysfunction suitable for surgery were so rare that the pursuit of such a speciality could come to little and maybe prove to be financially disastrous. He suggested other specialities. To anyone else his advice would have been sound, and it is the measure of Cushing's achievement that he has made of this branch one of the happiest and most productive, in a scientific sense, in medicine. His early interest had to be in traumatic material, but he soon found an outlet in devising new steps in the surgical approach for trigeminal neuralgia, and soon tumours began to come along.

The dominant figure in neurosurgery in Cushing's day was Victor Horsley, with Macewen silent yet forceful in the background. Cushing went to London hoping to work with Horsley, but found him so engrossed in his many pursuits that he felt that he would have little time for him. It would be interesting to speculate whether Horsley's interest in neurophysiology would have left a mark on Cushing's work. As it was, the more mechanistic studies which he made in Bern, on the effects of cerebral compression on blood pressure, proved to be extremely useful to him in a practical way; so we find him treating his patients and recording his experiences in the journals rather as physiological experiments on man than as loose clinical pictures. Things were going well for him at Johns Hopkins where he had risen to be associate professor of surgery when his bold diagnosis and fortunate operation on the man who was to become General Wood focussed attention sharply on him. Cushing in his later years recounted to the writer his feelings, so far as he was able to recapture them, and the facts of that famous case. He said that he felt sure that it was this operation, witnessed by Cabot of Boston, which brought him to the Moseley chair of surgery at Harvard University in 1912.

The correctness of the choice was made apparent to the whole world by the publication in the same year of his famous book on the pituitary body. It would be absurd to attribute the rise of endocrinology to the appearance of this book alone, but there can be no doubt that it profoundly affected medical thought. Here for the first time was a group of pituitary tumours which had been operated upon with a remarkable degree of success by one man, and more than that, his work in the research laboratories at Baltimore from 1908 onwards offered an explanation of some of the phenomena seen in man. Here was an exciting link between the animal laboratory and the bed-side. His interest in the ductless glands never ceased until the end of his life, nor his interest in experiment. Witness his injections of pituitrin and pilocarpine into the cerebral ventricles of man, his experimental pituitary basophilism in 1934, and his very recent work on anti-hormones. In 1917 his book on tumours of the nervus acousticus set the seal on his reputation. From that time onwards his work followed on predestined lines. It lay first in the classification of the tumours of the central nervous system, based on the observation that neoplasms tend to occur in certain situations, and to be regional in type. It would be untrue to give the impression that this thought has not occurred to anyone else, but certainly Cushing went much further than any of his contemporaries in deducing pre-operatively the probable nature of the tumour from a consideration of the history, signs and laboratory tests. The work of classification was greatly helped by Percival Bailey, who had indeed much the greater hand in the actual nomenclature of the tumours. Cushing often said that the work of his clinic showed acceleration in one direction or another, depending on the predilection of some personality in the clinic with exceptional gifts. Thus the extremely important work which came from the Brigham Hospital on the visual fields in localised intracranial lesions was due to the brilliance of C. B. Walker. From the date of his residency (1915–18) Cushing's case histories were invariably illustrated by visual fields which set a new standard in this work. The same thing happened again with Bailey, with Fulton and with others. As regards intracranial tumours his major contribution was something bigger than a study of cell structure. His system of following up his patients, of keeping in constant touch with them, of making them feel that here was a friend as well as a surgeon, enabled him to acquire a remarkable grasp of the natural histories of the tumours themselves, of their duration and of the expectation of life with different types. This was clearly brought to light by

the studies of results on groups of cases by Van Wagenen and Cairns.

His last great book on the meningiomas shows very well what could come out of a systematised clinic. He had planned to write it with George Hewer when he was at Baltimore on the basis of twelve cases, and he always said that it would have been a much better and more readable book than the one that finally appeared, which was based on over 300. When one tries to assess the most important contribution made by Harvey Cushing I think that one must give pride of place to the purely humanitarian fact that he had a lower mortality than anyone else, either before him or contemporaneously. His mortality indeed appeared to some so fantastically low that they openly refused to credit it. There can be no doubt whatever that it was strictly accurate. What perhaps made it more difficult still for the average man to understand was that he admittedly spent more hours over a single case than the general surgeon spent upon half a dozen. They did not see that this was the cause of success and that the Halstedian principles upon which he had been brought up were the foundation of everything. All the Baltimore school were slow operators, but in neurosurgery there was the more reason for it because there was everything to learn, and because impatience might well lead to disaster. Now that more is known the neurosurgeon can afford to be more speedy. He has learnt what is important and what is not, without the least abandonment of the fundamental principles. Cushing's view of disease seemed to be strangely mechanistic, that one could not trust too much to nature. His results certainly seemed to justify his belief. He cut clean across the traditional notion that if a patient had had an operation he should not be operated on again for a week or more if the object of the operation had not been achieved fully at the first attempt.

Many of the great pioneers have been great individualists. It falls to few to found a school. Horsley and Macewen are examples of this lapse in our own country. Cushing attracted people to his clinic from all over the world; they made themselves his pupils, his disciples and his friends. Few men can ever have had such a stimulating personality. The process of stimulation was indeed often somewhat painful to the co-worker who left to play his part elsewhere fired with an ability which he would never otherwise have developed, yet somewhat ruefully licking his wounds. Cushing was so dominant that it was difficult for other personalities to express themselves alongside him, and although few people could be more devastatingly charming than he, there were few more ruthless in the onward drive. His variations in temperament were somewhat baffling and a kind of Cushing saga has grown up around them. His habit of interrupting a speaker, paying no attention to what he was saying, and starting himself to speak about something quite different, could, to the uninitiated, be somewhat humiliating. This is only to say that he needed knowing, that a certain technique had to be adopted and he instantly became the most fascinating companion that one is ever likely to meet. His sense of humour was acute; he loved a joke or a good story. But he was strangely incurious about other people and never gossiped. There was a strong streak of tenderness in him that drew one irresistibly. He was capable of deliberately splitting infinitives throughout his book on tumours of the nervus acousticus; his recurrent "what is more," and "to be sure" were little oddities that made one like him the better. There is no doubt that he was a great artist. There was something electric about him, a stimulus to be got obtainable nowhere else. His ideals were of the highest; considerations of money never entered into his calculations, and although he had a sufficiently lucrative practice he disparaged fees out of proportion to the service rendered. He lived very simply, his one great extravagance being books. No one ever worked harder than he, more concentratedly and at such a high level of performance. Though often in great discomfort and pain, it was characteristic of him that he never mentioned his own ailments and actively discouraged discussion of them. He would never explain why a walk of a few yards or a flight of stairs to climb were repugnant to him. In his later years, when he alternated between a wheeled chair and the most incongruous bursts of walking, he still retained all his own fire. His entrance to a room could be relied upon to have the old effect, that sudden heightening of interest, that anticipation which was so rarely disappointed, as those lean fingers twisted and that unexpectedly deep voice boomed. He was the only surgeon to have a society called after him during his lifetime, and it was a most happy event that it was able to celebrate his seventieth birthday in April of this year by meeting in New Haven. He was truly one of the great figures in medicine of all time. He has set a standard of performance which we can neither equal nor forget.

Prof. Paterson Ross writes: Harvey Cushing invited me to work in Boston as a junior associate in his clinic in 1923, and from the moment of my arrival he treated me almost as a son. In the summer of that year he was writing Osler's life. For 3 months (out of medical school term) his regular routine was 8–11 A.M. dictating to his secretary; 11–3 or 4 hospital (operating and office work); 4.30–6.30 P.M. recreation, often tennis; 8–11 looking up references, files of the *Times* for the next morning's dictation (part of his house was cleared of all furniture except trestle tables for files of papers!). At week-ends he would go to Little Boar's Head (where he had a cottage near the sea) and run through letters, etc., and when friends from Baltimore came over he would read a chapter of the Life to them for criticisms, alterations and additions.

In the operating room he set himself a rigidly high standard, and he wouldn't permit of the slightest slackness in his assistants. He was a martinet, but a just one—never querulous or unreasonable, but fierce. If he gave you a refractor to hold, even if you had to hold it for 3 hours you'd got to hold it *still*, and if you shifted your weight from one foot to the other after getting almost cramped with inactivity he'd tell you to stop fidgeting. But the folk who worked for him were each and all imbued with his amazing idealism and would slave for him.

As an investigator his chief attribute was diligent attention to detail (as in his surgery). He was most methodical in his record keeping and in preserving his pathological material, and it was by laborious analysis of his records and correlating them with the pathological findings that he made his contributions to science. Most of his records were illustrated by his own sketches, beautifully but simply done. They looked very easy, but really there was much skill in them, the result of special training he obtained as a student by attending a night art school.

His influence on surgery has been stupendous; for his principles, learnt from Halsted, have influenced general surgeons as well as neurosurgeons. And the influence will be perpetuated in the work of all those who worked under him and are now carrying the torch in many lands.

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

THE dominating happening in Parliament last week was the Prime Minister's answer to Herr Hitler's "peace" offer. This offer was so evidently not an offer of peace at all but a manœuvre of war that the House was united behind Mr. Chamberlain in his statesmanlike and dignified reply. And after this reply the war situation on the Western front remains very quiet up to the time of writing on October 16.

Two other statements of major importance were made by Sir Kingsley Wood on the Air Services and Mr. Hore-Belisha on the Army. The Imperial Air Service foreshadowed by Sir Kingsley, with its training ground in Canada, typifies the world-wide character of this war more than anything has done up to the present. And with war on this scale we must consider strategy on a world scale. Will the war be limited to Europe? The P.M.'s statement and the two statements on two of the services showed the British war machine going into action and rather overshadowed other Parliamentary business.

* * *

But the rest of the time of Parliament was very well filled. A debate on two Education Acts, one for England and Wales and one for Scotland, putting back the school-leaving age to 14 was only notable for the definite pledge by the Government to restore the age to 15 after the war. These acts were necessary because recent education acts passed before the war raised the age to 15 and began to be operative in September last. Everyone agreed that the acts passed last week were not a final repeal of the 15 years age, but only a war-time suspension. Sir Percy Harris, the Liberal Chief Whip, made a good point when urging that under conditions where town children were scattered over widely spaced reception areas the Board of Education, as apart from the local education authorities, should take a larger share of control and responsibility for schools in those areas.

It was Sir Percy also, to be followed later in an admirable, and quite short, speech by Mr. L. S. Amery, who raised the point of what is to happen to the children left behind in the towns where schools are closed and where they are "running wild." As Mr. Amery asked, Is one of the results of the war to be a generation run wild? No one even yet quite knows the extent of the problem. How many children are there in London now? Sir Percy Harris got no definite reply to his question, because the ministries do not yet know. Evacuation at first was under school auspices, but it has been added to by voluntary exodus and subtracted from by the return stream to the towns which in some places has been more and in others less. What this to-ing and fro-ing has resulted in is not yet known and indeed the population is not yet stabilised.

If air attack develops on the scale originally anticipated—the Warsaw scale so to speak—then there will be a lot more private evacuation, indeed perhaps refugee evacuation. But the Government will have to consider whether some form of compulsion is not required in order to move people from vulnerable and put them into safe areas; the decision to move or not to move is one that is often very difficult and sometimes impossible for a private citizen to make.

* * *

Other parliamentary business during the week included further discussion of the Finance Bill and a frontal attack on the Ministry of Information and its roll of the 999. This significant number has been reduced, but Sir Edward Grigg warned the House that this did not necessarily mean its cost would be reduced. Referred to as the "fourth arm" (a distinction also claimed, by the way, for (*a*) finance and (*b*) civil defence) the Ministry of Information must clearly be an expensive service.

One useful suggestion made by Sir James de Rothschild in a very able speech was that we should arrange to have high-power transmitters in the Dominions and Colonies to spread our broadcast information still more widely over the world. There are the hundreds of millions of people in India, China and the rest of the far East—there are the hundred million black and white men in Africa—there are the millions in the two Americas. The strategy of information must be on a world scale.

What is going to happen to the new child population in the reception areas is not at sure as yet—here is another field for broad school broadcasting if the local education and the teachers would only waken up —but it will certainly be necessary t doctors to inspect and treat children at present.

Many questions on medical and all being asked on every suitable occasio and behind the scenes a redistributi proceeding apace. It would probably on the educational side, if the Board itself took a hand as Sir Percy Har One aspect of the matter was brought out b Graham-Little when he spoke of "the acu stress" to which government medical arran have submitted some distinguished members o medical profession. This is being met by an arrangement by which doctors can go on "indefinite leave" subject to recall if required.

Meanwhile it would seem to be certain that despite the stresses of various kinds that affect the medical profession it has been able to cover the medical needs of the services and the civilian community in a pretty satisfactory way and confidently expects to be able to meet the stress of actual air bombardment.

FROM THE PRESS GALLERY

Release of Full-time Members of the E.M.S.

IN answer to Sir RALPH GLYN in the House of Commons on Oct. 12 the Minister of Health said that there are normally approximately 97,000 hospital beds in the metropolitan police area, excluding beds for mental patients. Under the emergency hospital scheme an additional 14,000 beds have been set up in hospitals in the outer parts of the area, while approximately 13,000 beds have, for the time being, been closed in certain of the inner hospitals. Accordingly, the total number of beds available in the metropolitan police area is now about 98,000. Approximately 55,000 are immediately available in hospitals in the area of the London sector scheme (which is rather larger than that of the metropolitan police area) and these can be used either for casualties or for ordinary sick in need of inpatient treatment. Hospitals have been instructed to admit to their unoccupied beds all cases requiring inpatient treatment. As regards the release of members of the medical profession to carry on their normal duties, arrangements have been made under which doctors can either go on indefinite leave, subject to recall if required, or (with the exception of doctors filling posts as registrars, house-physicians and house-surgeons) go on part-time service under conditions

recently drawn up in accordance with the advice of a committee consisting of Sir Bernard Docker (chairman), Dr. G. C. Anderson, Sir Girling Ball, Dr. H. E. A. Boldero, Viscount Dawson of Penn, Mr. C. H. S. Frankau, F.R.C.S., Sir Cuthbert Wallace, and Sir Charles Wilson.

The conditions for part-time service are as follows:

1. Each officer who is transferred to part-time will make his services available to the state, if required, for the equivalent of four days in every week, the remainder of the time being at his own disposal. The precise manner of giving effect to this condition—i.e., the particular days or parts of days when the officer is to be on call—will be a matter for arrangement with the medical superintendent, subject to the approval of the group officer. A record of the times when the officer attends for duty will be kept by the medical superintendent.

2. He will receive a retaining fee equivalent to one-third of the salary which has been already offered to him. This fee will cover any services rendered under the previous paragraph, so long as he remains on a part-time basis.

3. Should circumstances make it necessary he will be required to resume whole-time, in accordance with the undertaking he has given, and in that event payment of full salary will be resumed.

officer who elects to go on part-time will be an allowance for board and lodging, or for tween his home and his official headquarters. such officers, being no longer whole-time servants, will not be entitled to official pay during temporary absences due to

isitioning of Hotels in Spas

e of Lords on Oct. 11 Lord GREVILLE responsible for commandeering hotels in h spas for civil departments. He said that ome thousands of people sought treatment as, including many workers who were most war-time. Judging from the experience of st war there would be a great increase in cases rheumatism or its kindred ailments—neuritis, arthritis, and so on. Most of these hotels were taken by the Government for use as offices. Were the medical military authorities consulted? And were the medical men who lived in these spas consulted about the likely number of people from essential trades who would need spa treatment in war-time? There was practically no accommodation left in some of these spas. That was a very short-sighted policy. —Lord MANCROFT said that this was a case of puerile stupidity.

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Blood-transfusion

Mr. CULVERWELL asked the Minister of Health whether the blood-transfusion organisation for the London and home-counties district was still taking regular donations of blood from registered blood-donors; and, since military requirements were provided for by a separate organisation which was a special branch of the Royal Army Medical Corps, what was done with this blood given by citizens.—Mr. ELLIOT replied: The blood-transfusion organisation for London and the home counties was set up to ensure a ready supply of blood. As blood can only be stored for a limited time, supplies are being continually taken from blood-donors. Arrangements have been made with the defence services that the stores of blood will be used to supply service requirements subject to civilian demands being satisfied, but blood which is taken and not used for its primary purpose is being utilised for the preparation of serum, a stock of which is invaluable under war conditions.

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Mr. ADAMS: If I supply the Minister with a contrary opinion will he undertake to apologise to the House?—Mr. ELLIOT: I will undertake to investigate any facts supplied by the hon. member.

Supplementary Rations for Invalids and Others

Mr. JAMES GRIFFITHS asked the Chancellor of the Duchy of Lancaster what provision was being made, in the contemplated rationing scheme, for issuing supplementary rations of certain kinds of foods to invalids, adolescents, and men and women engaged in heavy labour; and whether these supplementary rations would be of fixed quantities or at the discretion of local food committees.—Mr. W. S. MORRISON replied: The special claims of invalids, adolescents, and heavy workers in relation to rationed foods are recognised and are being examined.

Mr. GRIFFITHS: May I ask whether the question of supplementary rations to adolescent boys and girls is under consideration?—Mr. MORRISON: Yes, Sir.

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

THE dominating happening in Parliament last week was the Prime Minister's answer to Herr Hitler's "peace" offer. This offer was so evidently not an offer of peace at all but a manœuvre of war that the House was united behind Mr. Chamberlain in his statesmanlike and dignified reply. And after this reply the war situation on the Western front remains very quiet up to the time of writing on October 16.

Two other statements of major importance were made by Sir Kingsley Wood on the Air Services and Mr. Hore-Belisha on the Army. The Imperial Air Service foreshadowed by Sir Kingsley, with its training ground in Canada, typifies the world-wide character of this war more than anything has done up to the present. And with war on this scale we must consider strategy on a world scale. Will the war be limited to Europe? The P.M.'s statement and the two statements on two of the services showed the British war machine going into action and rather overshadowed other Parliamentary business.

* * *

But the rest of the time of Parliament was very well filled. A debate on two Education Acts, one for England and Wales and one for Scotland, putting back the school-leaving age to 14 was only notable for the definite pledge by the Government to restore the age to 15 after the war. These acts were necessary because recent education acts passed before the war raised the age to 15 and began to be operative in September last. Everyone agreed that the acts passed last week were not a final repeal of the 15 years age, but only a war-time suspension. Sir Percy Harris, the Liberal Chief Whip, made a good point when urging that under conditions where town children were scattered over widely spaced reception areas the Board of Education, as apart from the local education authorities, should take a larger share of control and responsibility for schools in those areas.

It was Sir Percy also, to be followed later in an admirable, and quite short, speech by Mr. L. S. Amery, who raised the point of what is to happen to the children left behind in the towns where schools are closed and where they are "running wild." As Mr. Amery asked, Is one of the results of the war to be a generation run wild? No one even yet quite knows the extent of the problem. How many children are there in London now? Sir Percy Harris got no definite reply to his question, because the ministries do not yet know. Evacuation at first was under school auspices, but it has been added to by voluntary exodus and subtracted from by the return stream to the towns which in some places has been more and in others less. What this to-ing and fro-ing has resulted in is not yet known and indeed the population is not yet stabilised.

If air attack develops on the scale originally anticipated—the Warsaw scale so to speak—then there will be a lot more private evacuation, indeed perhaps refugee evacuation. But the Government will have to consider whether some form of compulsion is not required in order to move people from vulnerable and put them into safe areas; the decision to move or not to move is one that is often very difficult and sometimes impossible for a private citizen to make.

* * *

Other parliamentary business during the week included further discussion of the Finance Bill and a frontal attack on the Ministry of Information and its roll of the 999. This significant number has been reduced, but Sir Edward Grigg warned the House that this did not necessarily mean its cost would be reduced. Referred to as the "fourth arm" (a distinction also claimed, by the way, for (*a*) finance and (*b*) civil defence) the Ministry of Information must clearly be an expensive service.

One useful suggestion made by Sir James de Rothschild in a very able speech was that we should arrange to have high-power transmitters in the Dominions and Colonies to spread our broadcast information still more widely over the world. There are the hundreds of millions of people in India, China and the rest of the far East—there are the hundred million black and white men in Africa—there are the millions in the two Americas. The strategy of information must be on a world scale.

What is going to happen to the new child population in the reception areas is not at all sure as yet—here is another field for broadcasting, school broadcasting if the local education authorities and the teachers would only waken up to its value—but it will certainly be necessary to have more doctors to inspect and treat children than there are at present.

Many questions on medical and allied matters are being asked on every suitable occasion in the House, and behind the scenes a redistribution of duties is proceeding apace. It would probably help, especially on the educational side, if the Board of Education itself took a hand as Sir Percy Harris suggested. One aspect of the matter was brought out by Sir Ernest Graham-Little when he spoke of "the acute financial stress" to which government medical arrangements have submitted some distinguished members of the medical profession. This is being met by an arrangement by which doctors can go on "indefinite leave" subject to recall if required.

Meanwhile it would seem to be certain that despite the stresses of various kinds that affect the medical profession it has been able to cover the medical needs of the services and the civilian community in a pretty satisfactory way and confidently expects to be able to meet the stress of actual air bombardment.

FROM THE PRESS GALLERY

Release of Full-time Members of the E.M.S.

IN answer to Sir RALPH GLYN in the House of Commons on Oct. 12 the Minister of Health said that there are normally approximately 97,000 hospital beds in the metropolitan police area, excluding beds for mental patients. Under the emergency hospital scheme an additional 14,000 beds have been set up in hospitals in the outer parts of the area, while approximately 13,000 beds have, for the time being, been closed in certain of the inner hospitals. Accordingly, the total number of beds available in the metropolitan police area is now about 98,000. Approximately 55,000 are immediately available in hospitals in the area of the London sector scheme (which is rather larger than that of the metropolitan police area) and these can be used either for casualties or for ordinary sick in need of inpatient treatment. Hospitals have been instructed to admit to their unoccupied beds all cases requiring inpatient treatment. As regards the release of members of the medical profession to carry on their normal duties, arrangements have been made under which doctors can either go on indefinite leave, subject to recall if required, or (with the exception of doctors filling posts as registrars, house-physicians and house-surgeons) go on part-time service under conditions

recently drawn up in accordance with the advice of a committee consisting of Sir Bernard Docker (chairman), Dr. G. C. Anderson, Sir Girling Ball, Dr. H. E. A. Boldero, Viscount Dawson of Penn, Mr. C. H. S. Frankau, F.R.C.S., Sir Cuthbert Wallace, and Sir Charles Wilson.

The conditions for part-time service are as follows:

1. Each officer who is transferred to part-time will make his services available to the state, if required, for the equivalent of four days in every week, the remainder of the time being at his own disposal. The precise manner of giving effect to this condition—i.e., the particular days or parts of days when the officer is to be on call—will be a matter for arrangement with the medical superintendent, subject to the approval of the group officer. A record of the times when the officer attends for duty will be kept by the medical superintendent.

2. He will receive a retaining fee equivalent to one-third of the salary which has been already offered to him. This fee will cover any services rendered under the previous paragraph, so long as he remains on a part-time basis.

3. Should circumstances make it necessary he will be required to resume whole-time, in accordance with the undertaking he has given, and in that event payment of the full salary will be resumed.

4. No officer who elects to go on part-time will be eligible for an allowance for board and lodging, or for travelling between his home and his official headquarters.

5. Similarly, such officers, being no longer whole-time temporary civil servants, will not be entitled to official leave, or to sick pay during temporary absences due to illness.

Requisitioning of Hotels in Spas

In the House of Lords on Oct. 11 Lord GREVILLE asked who was responsible for commandeering hotels in various British spas for civil departments. He said that every year some thousands of people sought treatment at these spas, including many workers who were most useful in war-time. Judging from the experience of the last war there would be a great increase in cases of rheumatism or its kindred ailments—neuritis, arthritis, and so on. Most of these hotels were taken by the Government for use as offices. Were the medical military authorities consulted? And were the medical men who lived in these spas consulted about the likely number of people from essential trades who would need spa treatment in war-time? There was practically no accommodation left in some of these spas. That was a very short-sighted policy. —Lord MANCROFT said that this was a case of puerile stupidity.

Earl STANHOPE, Lord President of the Council, said that the Government were bound to take active steps to evacuate essential departments, and that involved the taking over of alternative accommodation outside London. That was a complex and tremendous problem. The only buildings where they could find office accommodation which enabled official staffs more or less to work together were very large buildings, such as hotels or schools. The officials concerned had done their best to warn hotel proprietors that it was possible that their premises might be required if war should happen. Spas had been selected because the necessary hotel accommodation and living accommodation for the staffs which could be found in those places was not available in sufficient quantities in the ordinary provincial towns far away from the manufacturing centres. The question of the treatment of rheumatism, particularly Service patients, had been considered by a subcommittee on which the Ministry of Health and the service departments were both represented.—Lord GREVILLE: Were there any medical members of the service departments on the committee?—Earl STANHOPE said that there was not actually a doctor, he thought, but since this matter had been referred to the War Office seven buildings and three different spas had been earmarked for those suffering from rheumatism as a result of their service with the forces. Accommodation for the general public would still be available, though not as good accommodation. That was one of the disabilities of war-time. There were still a large number of boarding-houses and small hotels to which people could go if they wished to get treatment for rheumatism at these spas. The facilities at most of the hydropathics were still available.

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Mr. GRIFFITHS: May I ask whether the question of supplementary rations to adolescent boys and girls is under consideration?—Mr. MORRISON: Yes, Sir.

Consultants in the E.M.S.

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health whether he was aware that, as the result of his action in enrolling for full-time service nearly all the medical staffs of the voluntary hospitals in London at salaries which in most cases would hardly defray their house-rent, rates and taxes, he had subjected a large number of the most distinguished members of the medical profession to acute financial stress, inasmuch as they had been suddenly prevented from earning any income from private practice, but were unable to relinquish as suddenly their heavy commitments based on their previous earnings; and if he would consider making some legislative provision such as a moratorium in the payment of rent, rates and taxes in the case of consultants thus called up for national service.—Mr. ELLIOT replied: Recruitment to the Emergency Medical Service is on a voluntary basis. Salaries and conditions for this service were fixed in consultation with representatives of the medical profession. As I have already said, in reply to Sir RALPH GLYN, arrangements have been made under which doctors serving in the Emergency Medical Service can either go on indefinite leave, subject to recall if required, or, with certain exceptions, transfer from full-time to part-time service. I think the hon. member will agree that these arrangements should enable the practitioners to whom he refers to continue private practice. I regret that I am unable to accept the suggestion in the last part of the question.

Dismissal of Doctors

Mr. PARKER asked the Minister of Health (1) whether the sector officers in charge of the Emergency Medical Service in various districts were consulted before the letter sent out on Oct. 6; and what steps he was taking to ensure that there were an adequate number of doctors available in the event of air-raids; and (2) if he was aware that house-officers never had written contracts with hospitals; why such an assumption was made in the letter of dismissal from the Emergency Medical Service sent out by his department on Oct. 6 to a large number of doctors; and whether his department proposed to fulfil its obligations for the past five weeks' work.—Mr. ELLIOT replied: The letter to which the hon. member refers was sent out in error. All group officers have now been advised as to the actual position of the doctors in question. The answer as regards obligations incurred during the past five weeks is in the affirmative.

Salaries for A.R.P. Work

Sir RICHARD ACLAND asked whether the Minister would make every effort to reinstate doctors who gave up salaried posts for air-raid precautions work under the impression they would be paid £550 a year, and who now found they were paid £21 a year.—Mr. ELLIOT replied: I am not aware of any case such as the hon. member describes, but if he will let me have particulars I will certainly investigate the matter.

Hutment Hospitals

In reply to Mr. GALLACHER, Mr. ELLIOT said that in England and Wales, one hundred and four hutment hospital schemes, of 1037 huts, comprising 38,120 beds, have been decided upon. In seventy-one of these schemes the estimate of cost submitted by a local architect has been approved and construction of the huts has begun. In the remainder, tenders are being awaited. Two of the schemes, comprising 23 huts, have been completed, and in several more the roofing and walling has been finished so that they could be used, in an emergency, if required. Medical, nursing and other personnel will be allotted to the hutment hospitals as they are completed, but I am not in a position to give the numbers. As the huts are not yet actually in use I cannot express any opinion on their functioning, but I have every reason to trust that it will be satisfactory.

Mr. GALLACHER: May we take it that the medical and nursing staffs will be fully and adequately remunerated for the services that they give?—Mr. ELLIOT: They will be remunerated on the same terms as those of their comrades who are serving already in hospitals.—Mr. GALLACHER: Is the right hon. gentleman aware that there are very serious complaints from doctors in many of these institutions about the treatment they are receiving?—No further reply was given.

Payments to Hospitals

Brigadier General Sir ERNEST MAKINS asked what were the amounts paid by the Minister of Health to hospitals in respect of wards assigned to air-raid casualties; whether the Minister was satisfied that the system which entailed a heavy outlay on the state was working satisfactorily; and whether this outlay could be reduced since it was far more than the hospitals would receive from civil patients were they able to be accommodated.—Mr. ELLIOT replied: Payments in respect of beds reserved for air-raid casualties are at present being made only to voluntary hospitals. They are made fortnightly, and the total payments so far made for the first fortnight have amounted to approximately £170,000. This figure will be subject to considerable adjustment in the light of additional information being received from the hospitals following the payments. In reply to the second part of the question, I am satisfied that this system is enabling us to have many beds ready and staffed for casualties which would not otherwise be available. I do not consider the provision being made against air-raid casualties unreasonable. I am, however, reviewing the list of hospitals where beds are reserved for casualties in order to ensure that beds are not being kept empty unnecessarily. In reply to the third part of the question, the payments being made to the hospitals are not related to the payments normally made by civil patients, since these do not as a rule meet the whole cost of treatment. Voluntary hospitals are largely dependent on contributions and other charitable sources for the treatment of civil patients, but the Government have undertaken that the cost of treating casualties shall be borne by the Exchequer. The department are investigating the claims for payment being submitted by hospitals in order to ensure that they properly correspond with the actual additional expenditure in which the hospitals are involved by reason of the emergency hospital scheme.

Mental Patients

Sir RALPH GLYN asked what was the total number of persons undergoing restraint in mental asylums who had been released under the hospital emergency scheme to go to their homes; and what arrangements were made for their care and supervision.—Mr. ELLIOT replied: I am advised that the number of persons who were so discharged to their homes from mental hospitals does not exceed 200. No patient was discharged unless selected after careful investigation of all relevant circumstances, including his home conditions, as suitable to be cared for and supervised by his relatives at home. The Board of Control are reviewing the arrangements for the care and supervision in war-time of individuals living in the community who are suffering from mental disorder.

London Children's Hospitals

Sir RALPH GLYN asked what was the number of beds in the hospitals in the Metropolitan police area available for sick children at the present time; and what were the arrangements under the hospital emergency scheme for the normal treatment of children undergoing specialist treatment of one kind and another who were unable to go far afield to receive it.—Mr. ELLIOT replied: Many of the beds in the general hospitals are available for children, but the figures I have do not distinguish children's beds from adults' beds. There are, I understand, in general, beds available for all requiring hospital treatment. Although a number of beds have been reserved under the emergency hospital scheme for the treatment of casualties, the ordinary hospital services remain available. There should, therefore, not be difficulty in obtaining specialist treatment required by children who remain in London, but if my hon. friend has any particular case in mind I should be glad to look into it, if he would let me have particulars.

Col. NATHAN: In view of the answer, how does it come about that the right hon. gentleman's department has informed me, as chairman of the Infants Hospital, Vincent Square, that notwithstanding the specialist nature of that hospital, as a hospital for children which, under the orders

of his department, was evacuated at the outbreak of war, it is not desired that the hospital should be reopened ?—Mr. ELLIOT: There are a number of places where specialist treatment can be obtained, but if the hon. gentleman desires to open the hospital for specialist services I shall be very glad to go into the matter.

Outpatients

Mr. PARKER asked whether the Minister of Health was aware that outpatients from London hospitals, who had been told to attend their local hospitals during the war, had now been told to go to a local doctor; and that this change was causing discontent owing to the consequent inability to obtain special treatment and the extra cost; and whether the Minister could review the civilian medical services to correct such anomalies.—Miss HORSBRUGH, parliamentary secretary to the Ministry of Health, replied: No instruction has been given under the emergency hospital scheme that persons who normally attend at hospitals for outpatient treatment should go to a local doctor instead. I am aware that at the beginning of the war some London hospitals temporarily closed their outpatient departments of their own volition, but I understand that most of these have now been reopened. The last part of the question does not, therefore, arise.

Midwives

In reply to questions by Mrs. Adamson, Mr. ELLIOT said that the number of midwives on the Midwives Roll who are entitled to practise as midwives in England and Wales is 63,275. The number of midwives returned by local supervising authorities as practising in England and Wales in 1938 was 16,761. Figures are not available of the number practising at the present date. The number of midwives who have surrendered their certificates under subsections (1) and (2) of section 5 of the Midwives Act, 1936, and whose certificates have been cancelled by the Central Midwives Board, is 2780. Separate figures are not available of the number of certificates surrendered under subsection (2) which relates to compulsory surrender where a midwife is incapable, by reason of age or infirmity of mind or body, of efficiently performing her duties as a midwife.

Refugee Nurses

Mrs. ADAMSON asked the Home Secretary the number of trained and partially trained refugee nurses, respectively, now resident in Great Britain and the number of those allowed to be employed in nursing work.—Sir JOHN ANDERSON replied: There are about 180 trained and 840 partially trained refugee nurses in the United Kingdom. All of them are at present engaged in nursing work.

News of the death in Devon of Major-General W. C. H. FORSTER, I.M.S. (rtd.), at the age of 65 has come as a shock to his many friends. He had appeared to be in perfect health until a few minutes before the end came. Forster was a man of exceptional attainments; he filled several important teaching and administrative posts with distinction. He had a forceful personality, a keen intellect and a gift of clear expression. As director of public health in the Punjab he was nominated to membership of the Legislative Council and in this capacity he spoke with eloquence and conviction on public-health matters. As a teacher of pathology and hygiene at the Lahore medical college he aimed at turning out competent doctors and hygienists rather than specialists in his own subjects. He was one of the earliest workers on the preparation of preventive vaccines against bacillary dysentery, and would undoubtedly have achieved success as a research worker if his services had not been otherwise required.

Medical News

University of Wales.

At recent examinations the following were successful:

D.P.H.

Part II.—H. L. Ackerman, D. J. Davies, S. H. Graham, C. T. Jones, J. J. O'Reilly, James Paterson, H. R. Stubbins, A. J. Thomas.

University of Manchester.

Dr. D. D. Cranna has been appointed assistant lecturer in anatomy, and Mr. A. W. Moule, L.D.S., clinical lecturer in dental surgery.

University of Sheffield.

Mr. C. D. P. Jones has been appointed hon. demonstrator in anatomy.

Royal College of Surgeons of England

A quarterly meeting of the council of the college was held on Oct. 12 with Mr. Hugh Lett, the president, in the chair. Mr. R. St. Leger Brockman was re-elected a member of the court of examiners, and Mr. H. F. Humphreys was re-elected a member of the board of examiners in dental surgery.

It was decided to cancel the arrangements for holding the forthcoming primary examinations for the fellowship in India, Egypt and Australasia, but it was not found necessary to make any change in the regulations for the primary or final fellowship examinations during the war. The next fellowship and dental examinations will be conducted in London in the normal way.

Diplomas of fellowship were granted to Eric Samuel (Cardiff and Middlesex) and Robert Clarence Laird (Toronto) and diplomas of membership were granted to P. B. Banaji, R. D. N. Bisset, J. D. D. Boswell, J. C. Herepath, H. E. Hobbs, F. G. Lougee, Simon Meleck, P. A. Menon, F. B. Norrish, J. F. Roberts, A. R. F. Thompson, M. M. Walker, and J. F. Williams.

A licence in dental surgery was granted to K. R. D. Porter.

The autumn series of Arnott and Erasmus Wilson demonstrations has been cancelled. The Hunterian lecturers will be asked to deliver their lectures if possible. If they are unable to do so they may publish the lecture and use the title of Hunterian professor. Mr. Ernest Hey Groves will give the Moynihan lecture in March, 1940.

Sir Walter Langdon-Brown will deliver the Thomas Vicary lecture as arranged on Nov. 30, but at 3 P.M.

Sir James Walton will deliver the Bradshaw lecture on Dec. 14, at 3.30 p.m. The Buckston Browne dinner will not be held this year. The annual meeting of fellows and members will be held on Nov. 16 at 3 p.m. and not 4 p.m. as previously arranged. The museum is closed but the library will remain open until further notice.

Casualty Evacuation Trains

The casualty evacuation train inspected by the Queen at Victoria on Oct. 13 is one of twenty based on Greater London. There are also eight of these trains in the provinces, and two in Scotland. Their primary purpose is to evacuate air-raid casualties from the hospitals in vulnerable areas to the base hospitals, and their crews consist of one medical officer, one hospital train officer, three trained and ten auxiliary nurses supplied by the Civil Nursing Reserve and eight St. John Ambulance Brigade orderlies.

Each train is made up of nine parcel vans converted to take 30 stretchers in each van. Brackets have been fixed on the sides of the van, the stretchers being carried in two tiers. One compartment serves as an office for the medical officer in charge. In addition to the two brake-vans there is a saloon carriage providing further accommodation for the crew. This carriage is soon to be replaced by a saloon coach with a kitchen attached, so that patients may have hot meals during their journey. All train crews have been working on their trains for some time, and are now an organised team.

Honours (in India)

The following rewards are announced for distinguished services in Waziristan: Major M. P. Power, O.B.E., M.C., R.A.M.C., has been made brevet lieut.-colonel. Lieut.-Colonel J. R. N. Warburton, M.C., Major M. P. Power, and Captain W. M. Stewart, M.B., all of the R.A.M.C., have been mentioned in dispatches.

Royal College of Physicians of Edinburgh

On Tuesday, Oct. 24, at 5 p.m. in the hall of the college, 9, Queen Street, Dr. J. Crighton Bramwell will deliver the George Alexander Gibson lecture. He will speak on blood-pressure.

Golden Square Throat, Nose and Ear Hospital

By arrangement with the Ministry of Health, the out-patient department of this hospital has now been re-opened.

Food Education Society

Dr. T. H. Sanderson-Wells has accepted the chairmanship of this society in succession to the late Dr. Harry Campbell. Lord Horder, Sir Albert Howard, Dame Louise McIlroy and Captain G. S. Elliston, M.P., have been elected vice-presidents.

Society for Relief of Widows and Orphans of Medical Men

At a quarterly court, held on Oct. 11, Mr. V. Warren Low, the president, being in the chair, the deaths of a member and two of the widows in receipt of grants were reported. One of these had received £3,500 during the past 34 years; her husband had been elected a member in 1868 and had paid in subscriptions £52 10*s*. The audited accounts for the half-year ended June 30 were presented: £2,242 10*s*. had been distributed during that period among 62 widows and 4 orphans. A widow of a member applied for relief and was granted £60 a year. Owing to increased income tax (not repaid until April) no Christmas present can be given this year.

Membership of the society is open to any registered medical man, resident at the time of his election within a twenty-mile radius of Charing Cross. Full particulars from the Secretary at 11 Chandos Street, London, W.1.

The Lancet 100 Years Ago

Oct. 19, 1839, *p.* 107.

From an oration by Mr. William Farr:

M. Quetelet, in his work "Upon Man," has the following passage:—"As regards medicine, it may shut some of the doors which lead to the grave, but it will at the same time throw others wider open, for it can only increase the list of the living by making the supernumerary population live at the expense of society. Æsculapius himself could not by his art confer immortality upon the one-half of mankind, without condemning them to improduction, or doubling the mortality of the other half." . . . M. Quetelet is an amiable member of society; but this creed may be muttered by a murderer—by an unnatural mother over her strangled child—by a parricide over the grave of his father. Need I say, it cannot be true. It is a perversion and a misapplication of the doctrines of population, which Malthus had the merit of discovering; and you will permit me, in a few words, to show its fallacy, as statesmen may be silently induced to plunge the country into war, to overlook the public health, or to neglect the sick poor, under the colour that it is a desideratum to get rid, in any way, of a superfluous population.

Appointments

CARRUTHERS, W. L., M.B. Leeds, assistant medical officer at the Cheshire County Mental Hospital, Macclesfield.

GUY, J. A., M.B. Edin., D.P.H., deputy medical officer of health, port medical officer and assistant tuberculosis officer for Barrow-in-Furness.

MCKEE, G. K., F.R.C.S., hon. assistant orthopædic surgeon to the Norfolk and Norwich Hospital.

MASON, W. N. M., M.D. Lpool, D.P.H., deputy medical officer of health for Plymouth.

Examining Surgeons under the Factories Act, 1937: Dr. J. V. M. DAVIES (Shefford district, Bedfordshire); Dr. S. H. MARTIN (Nuneaton district, Warwickshire).

Medical Diary

Week beginning October 23

ROYAL SOCIETY OF MEDICINE, 1, WIMPOLE STREET, W.1.

MONDAY

Odontology, 2.30 P.M., Mr. S. F. St. J. Steadman: The Condition of the Teeth in the Australian Aborigines. (Presidential address.)

TUESDAY

Orthopædics, 2 P.M., Dr. J. Trueta (late director of the department of surgery, General Hospital of Catalufiya, Barcelona): The Organisation and Treatment of War Casualties.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

TUESDAY, OCT. 24.—5 P.M., (9, Queen Street), Dr. J. Crighton Bramwell: Blood-pressure.

Vacancies

Birmingham, St. Chad's Hosp.—H.P. and Anæsthetist, at rate of £150.

Brighton, Sussex Eye Hospital, Eastern Road.—H.S. at rate of £150.

Bristol Royal Hospital—Radio Diagnostician, £500.

Central London Throat, Nose and Ear Hosp., Gray's Inn Road, W.C.1.—Hon. assts. in out-patients' dept.

Grimsby and District Hosp.—H.P., at rate of £150.

Huddersfield County Borough.—Assist. M.O.H. £500.

Hertford County Sanatorium, Ware Park.—Temp. asst. res. M.O., £350.

Ilford, West Ham Hospital for Nervous and Mental Disorders, Goodmayes.—Jun. M.O., £350.

Liverpool Royal Children's Hosp., Myrtle Street.—Res. Cas. O., at rate of £250.

Middlesex Hosp., W.1.—Hon. Dental Surgeon.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Phys.

Northamptonshire County Council.—Asst. county M.O. and district M.O.H., £800.

North Riding of Yorkshire County Council.—Deputy County M.O.H. and Deputy School M.O., £750.

Preston and County of Lancaster Queen Victoria Royal Infirmary. Res. Surg. O., £300.

Reading, Royal Berkshire Hosp.—Surg. Reg.

Rochdale Infirmary and Dispensary.—H.P., £150.

Stafford, Staffordshire General Infirmary.—H.P., £150.

Swindon, Swindon and North Wilts Victoria Hosp.—Hon. surgeon to ear, nose and throat dept.

Truro, Royal Cornwall Infirmary.—H.S. to Orthopædic and Fracture Dept., £120.

Wolverhampton, New Cross Hosp. and Institution.—Asst. (Deputy) M.O., £350.

The Chief Inspector of Factories announces the following vacancies for examining surgeons: Stanford-le-Hope, Essex; Presteign, Radnor; Handsworth, York; and Abercrave, Brecon.

Births, Marriages and Deaths

BIRTHS

BRYAN.—On Oct. 8, at Gahini, Africa, the wife of Dr. T. B. L. Bryan—a daughter.

CAMPBELL.—On Oct. 15, at Dundee, the wife of Mr. W. G. Campbell, F.R.C.S.—a daughter.

FIFE.—On Sept. 16, at Dehra Dun, U.P., India, the wife of Captain J. Gordon Fife, I.M.S.—a son.

MORRIS.—On Oct. 12, at Dumfries, the wife of Dr. W. I. C. Morris—a daughter.

RICHARDSON.—On Aug. 28, at Farnham, Surrey, the wife of Dr. J. D. Richardson—a son.

MARRIAGES

DODS—HAYES—On Oct. 14, at Richmond, Alan Sydney Dods, M.B., to Kathleen Mary Hayes.

JONES—RAWLINS.—On Oct. 14, at Bristol, John Edgar Vaughan Jones, M.B., of Budleigh Salterton, to Doreen Elsie Rawlins, of Southampton.

MCKEON—THIERSCH.—On Oct. 7, at Newcastle-upon-Tyne, James Aloysius McKeon, M.D., to Katherine Vera Thiersch.

DEATHS

CORNISH.—On Oct. 12, at Dorking, Sydney Cornish, M.D. Lond.

FENWICK.—On Oct. 14, in London, Bedford Fenwick, M.D. Durh., aged 84.

FORSTER.—On Oct. 11, at Northlew, Devon, Major-General William Charles Hughan Forster, C.I.E., M.B. Edin., I.M.S. (retd.).

PITTS.—On Oct. 15, at Mount Vernon Hospital, Northwood, Arthur Thomas Pitts, D.S.O., M.R.C.S., L.D.S., aged 58.

ROBERTS.—On Oct. 9, at Brighouse, Frank Allan Roberts, M.D. Lond.

SUTHERLAND.—On Oct. 10, at Amersham, George Alexander Sutherland, C.B.E., M.D. Edin., F.R.C.P., aged 78.

THOMAS.—On Oct. 9, at Newport, Mon., Thomas Morrell Thomas, M.D., M.S. Lond., aged 68.

NOTES, COMMENTS AND ABSTRACTS

SULPHANILAMIDE AND THE EYE

SULPHANILAMIDE is under trial for the treatment of certain inflammatory disorders of the eye, such as uveitis, some forms of chronic conjunctivitis (including trachoma), and panophthalmitis. Bellows and Chinn [1] have produced some interesting facts in connexion with the distribution of sulphanilamide in the various ocular tissues after the administration of a single dose by mouth; the penetration in the eye after divided therapeutic doses; the action of heat and chemicals on the concentration of sulphanilamide in the aqueous humor, and the effects of local application of this drug to the eye by dusting it on to the conjunctiva and cornea and by injecting a solution of it beneath the conjunctiva. Their experiments on animals show that sulphanilamide penetrates the ocular tissues rapidly, traces being found 15 minutes after ingestion. The order of maximal penetration seems to depend on the vascularity of the tissue; for instance, an hour after the administration of a large single dose diminishing concentrations of the drug were found in the chorioretinal tissues, the corneoscleral tissues, the aqueous, the lens, and the vitreous, in that order. The maximal concentrations were reached in the corneosclera at the end of four hours; in the blood, aqueous, and vitreous at the sixth hour; and in the lens, choroid, and retina at the twelfth hour. Forty-eight hours after the ingestion of the drug the lens had the highest concentration. The most rapid rise in the concentration of sulphanilamide was between the second and third hours in all the ocular tissues except the lens, in which it took place between the fourth and sixth hours. The tissues which contained the higher concentrations were the quickest to lose the drug. Thus the lens, which had a relatively low concentration, retained it longest and at the end of forty-eight hours contained 2·5 mg. per 100 c.cm.—more than thrice the amount in the other ocular tissues.

Sulphanilamide 0·075 g. per kg. of body-weight was administered daily to rabbits in four divided doses at 8 A.M., noon, 6 P.M., and 10 P.M. The eyes were removed for estimation of the contents of the drug in the various ocular tissues at the end of one, two, four, and six days, and the blood was examined for this purpose at the same time. The highest concentration was 3·5 mg. per 100 c.cm. of blood at 10 P.M., and the lowest 1·4 mg. at 8 A.M., the time at which the eyes were excised. These readings are below the blood level of 5–10 mg. per 100 c.cm. advocated for therapeutic action. The fall in the tissue concentration of sulphanilamide from six to twelve hours after administration seems to be slight; therefore Bellows and Chinn suggest that the administration of sulphanilamide in two doses (at 9 A.M. and 5 P.M.) instead of four would be as effective.

They found that heat and the administration of chemicals such as ethyl morphine hydrochloride, atropine, and physostigmine, had no effect on the concentration of sulphanilamide in the aqueous, but that acetyl-β-methylcholine chloride (Mecholyl) led to an increase of concentration over the control values, as also did the effect of a paracentesis of the anterior chamber followed in half an hour by a second paracentesis. The local application of sulphanilamide dusted on to the conjunctiva and cornea causes some irritation, and the drug does not penetrate to any appreciable extent. After subconjunctival injection of the drug the aqueous concentration was far below that which followed oral administration. Sulphanilamide was found in the tears of two patients who were receiving 3 g. daily: in one patient three hours after the administration of 1 g. of the drug the tears contained 1·5 mg. per 100 c.cm., and seventeen hours after a similar dose the concentration was 0·8 mg. per 100 c.cm. These experiments show the permeability of all the ocular tissues in some degree to sulphanilamide.

1. Bellows, F. G., and Chinn, H., *J. Amer. med. Ass.* 1939, **112**, 2023.

THE HOME DOCTOR

THOSE feeling the need of distraction in these troubled times might do worse than turn for it to that breezy man-of-the-world, Dr. Victor Heiser. In his latest book,[1] written in an engagingly chatty style, he writes of what he considers are the things that matter in the pursuit of health. The lay public, as he truly points out, lives amid a welter of information about health, most of it unscientific and contradictory—What shall it do to be saved? Dr. Heiser refuses to accept pronouncements on health, be they never so ponderously delivered, which have no scientific basis of fact, and urges the reader to do likewise. "One of the truest rules of biology," he says, "is that there is no 100 per cent.; you yourself may be an exception to any of the accepted conclusions." In the words of Sir Francis Bacon, which Dr. Heiser quotes, "a man's own observation, what he finds good of, and what he finds hurt of, is the best physic to preserve health." This cheerful book is to be warmly commended to a generation all too apt to flit lightly from fad to fad.

1. You're the Doctor. By Victor Heiser, M.D. London: Jonathan Cape. 1939. Pp. 322. 8s. 6d.

UPHILL JOURNEY

Miss Elizabeth Echlin has been, from an early age, a martyr to ill health, which began with a long period of undiagnosed abdominal tuberculosis. All her life, it seems, she has been in and out of the hands of doctors and surgeons; nor have poverty and the urgent necessity of earning a livelihood made her lot any easier. The account of her sufferings given in her book (Keep Off—Death! London: William Hodge and Co. 1939. Pp. 336. 8s. 6d.) leave no doubt as to her courage, but the style is all too reminiscent of those wordy and highly coloured histories delivered with such relish by the more neurotic type of patient. Apart from the beneficent effect upon the writer of this kind of mental catharsis, it is open to doubt whether any useful purpose is served by these purely subjective records of disease backed neither by scientific knowledge nor philosophic detachment.

ELIMINATING SKIN-GRAFTING DIFFICULTIES

Dr. Philip Weatherbe, surgeon to the Children's Hospital, Halifax, N.S., writes:—10 per cent. tannic-acid solution, applied to the raw area, from which the grafts have been taken, settles one difficulty. Paraffin-mesh tissue, applied over the newly grafted area and fixed with ribbons of adhesive strapping in order to press and hold the grafts in position, ensures the "taking" of the graft. To apply dripping-wet boric lint over the mesh and hermetically seal in this moisture with a piece of oiled silk on top of the lint will most certainly eliminate the possibility of suppuration. The oiled silk should be fixed in place with adhesive strapping. The dressing should not be removed for at least ten days, when a fresh one is applied, in like manner. The dressing is again changed at five-days intervals until complete healing has occurred. The application of this method to difficult cases such as webbed fingers has proved its success over others. The tannic-acid scab drops off within a fortnight, leaving no scar.

WANTED—A SKELETON

Mr. Macleod Yearsley, F.R.C.S., writes:—Would any of your readers give, or lend for the duration of the war, an articulated skeleton for use in first-aid classes? I should be most grateful if anyone willing to do either would communicate with me at "Winscombe," Ethorpe Close, Gerrards Cross.

SULPHUR IN FOODS

THE composition of our more usual foods is beginning to be fairly well known, though it is not always easy to find the facts one wants. Information as to the sulphur content, however, remains scanty, and the figures available are not consistent. The differences are no doubt partly due to variability of composition, but some of the analytical methods used are of limited applicability, and some of the data were obtained on material which had been dried and may have lost sulphur in the process. The figures given in a paper by Margery Masters and R. A. McCance in the *Biochemical Journal* (August, 1939, p. 1304) will therefore be welcomed, especially as Miss Masters (*Ibid*, p. 1313) has fully investigated the determination of sulphur by well-known methods and by a new one based on reduction to H_2S instead of oxidation to H_2SO_4, and the determinations have been made both on fresh and on dried materials. Of over 300 foods examined only 0·1 per cent. contained as much as 100 mg. of sulphur per 100 g. of undried food, and in many of these a high protein content was probably responsible for a large proportion of the sulphur. Fish, meat, and cheese are typical examples. The ratio of nitrogen content to sulphur content of meats varied only from 13·7 to 17·8, the average being 15·2, which is of the same order as in most proteins. Sulphur is said to be present as cystine, methionine, and stable organic and inorganic sulphates in most foods. A striking example of the last is carragheen moss, which contained no less than 5·46 per cent. of sulphur, mostly as SO_4. Mustard, which contains allyl thiocyanate, yielded 1·28 per cent. of sulphur (1280 mg./100 g.). Of organs the liver contained most sulphur and least water: calves' liver 66·8 per cent. of water and 264 mg./100 g. of sulphur, and ox liver 69·0 per cent. and 263 mg./100 g. respectively, the N/S ratio being 11·1 and 11·8. Sweetbread and tripe with 71·1 and 81·6 per cent. of water contained 98 and 103 mg./100 g. of sulphur and had N/S ratios of 20 and 20·6 respectively, whereas sheep's brain with sulphur and water contents of the same order (80·1 and 108) had a much lower N/S ratio (14·9). Other organs varied between these limits. Shellfish, with sulphur contents of 262–401 mg./100 g., yielded low N/S ratios (5·6–11·2). It is suggested that sulphates from sea water may in part be responsible for the high sulphur content.

The sulphur content of fresh apricots, figs and peaches was respectively 6·1, 12·9, and 5·7. Dried fruits of the same kinds contained 164, 80·8 and 240 respectively. Some of the difference must be due to an increase in dry matter generally, and if figs are deemed to contain as much water as do turnips (about 90 per cent.), drying to 40 per cent. of water would allow for the increased sulphur. But apricots and peaches would have to contain over 95 per cent. of water and to be dried completely for the natural sulphur content to be responsible for the high values obtained. A more probable explanation is the use of sulphur dioxide as a preservative.

STAFF OF THE E.M.S.

The following is the complete and up-to-date list of group officers and regional hospital officers of the Emergency Medical Service.

LONDON GROUP OFFICERS

Sectors I and II.—Mr. Russell Howard, Essex County Hospital, Hermon Hill, Wanstead.

Sector III.—Sir Girling Ball, Science Block, Mill Hill School, London, N.W.7.

Sector IV.—Dr. W. J. Pearson, Brockley Hill House, Brockley Hill, Stanmore.

Sector V.—Dr. H. E. A. Boldero, Charlbury, Chorley Wood Road, Rickmansworth.

Sector VI.—Sir Charles Wilson, Cave House, High Street, Uxbridge.

Sector VII.—Mr. C. H. S. Frankau, Percy House, P.A.I., Twickenham Road, Isleworth (Middlesex C.C.).

Sector VIII.—Mr. C. Max Page, County Hall, Kingston-upon-Thames (Surrey C.C.).

Sector IX.—Mr. John Hunter, "Sherwood," adjoining Horton Mental Hospital, Epsom (L.C.C.).

Sector X.—Prof. T. B. Johnston, Boundary House, Orpington P.A.I. (Kent C.C.).

PROVINCIAL GROUP OFFICERS

Birmingham.—Prof. L. G. Parsons, Public Health Department, The Council House.

Liverpool.—Mr. K. W. Monsarrat, The Medical Institution.

Manchester.—Prof. A. H. Burgess, 17, St. John Street.

Sheffield.—Dr. A. G. Yates, 53, Wilkinson Street.

Leeds.—Mr. Harold Collinson, 27, Park Square.

Bristol.—Prof. Hey Groves, 25, Victoria Square, Clifton, Bristol.

Newcastle.—Mr. F. C. Pybus, Windsor House, Jesmond Road.

Hull.—*Mr. T. Ritchie Rodger, 21, Albion Street.

Bradford.—Dr. J. F. Allan, Bridge End, Low Baildon, Shipley, Yorks.

Stoke-on-Trent.—*Dr. E. C. Myott, 10, Brook Street.

Brighton.—Mr. L. A. Parry, 5, The Drive, Hove.

Walsall.—*Dr. Robert Forrest, "Halmot," Broadway, Walsall.

Reading.—*Dr. G. O. Lambert, 9, Eldon Square.

Oxford.—*Major-General Sir Robert McCarrison, 41, St. Giles.

Exeter.—*Colonel Ransom Pickard, 1, Barnfield Crescent.

Nottingham.—*Dr. W. T. Rowe, 8, The Ropewalk.

Leicester.—*Dr. J. P. W. Jamie, Public Health Department, 17, Friar Lane.

Coventry and Warwick.—*Mr. G. G. Alderson, Offchurch, Leamington.

Derby.—*Dr. F. G. Lescher, 307, Burton Road.

Sunderland.—*Dr. P. C. Arnold, 13, Grange Terrace.

Cambridge.—Prof. J. A. Ryle, Department of Medicine, University of Cambridge.

WALES

Cardiff.—*Dr. Robert Armstrong, Royal Infirmary, Newport Road, Cardiff.

REGIONAL HOSPITAL OFFICERS

No. 1. *Northern Region.*—Colonel H. T. Bates, Clarendon House, Clayton Street West, Newcastle-upon-Tyne.

No. 2. *North-Eastern Region.*—Dr. C. F. Good, 8, The Headrow, Leeds.

No. 3. *North Midland Region.*—Dr. G. C. Kelly, 28a, Regent Street, Nottingham.

No. 4. *Eastern Region.*—Dr. A. L. Banks, University of Cambridge, Tennis Court Road, Cambridge.

No. 5. *London Region.*—Dr. J. N. Dobbie, 21, Cromwell Road, S.W.7.

No. 6. *Southern Region.*—Dr. A. L. Dykes, 17, Bath Road, Reading.

No. 7. *South-Western Region.*—Dr. C. R. Nicholson, 3, Woodland Road, Tyndall's Park, Bristol.

No. 8. *Wales Region.*—Dr. A. Trevor Jones, Welsh Board of Health, Cathays Park, Cardiff.

No. 9. *Midland Region.*—Colonel A. B. Ward, 139, Hagley Road, Edgbaston, Birmingham 16.

No. 10. *North-Western Region.*—Dr. W. H. C. Patrick, Sunlight House, Quay Street, Manchester.

No. 11. *Scottish Region.*—Department of Health for Scotland, Princes Street, Edinburgh.

No. 12. *South-Eastern Region.*—Dr. W. S. M. Craig, The Chestnuts, Grove Hill Road, Tunbridge Wells.

* On a part-time basis.

CORRIGENDUM.—"Life's Beginning on Earth," by Professor Beutner, which was reviewed in our columns on Oct. 7, is published by Messrs. Baillière, Tindall and Cox and not by Messrs. Chapman and Hall.